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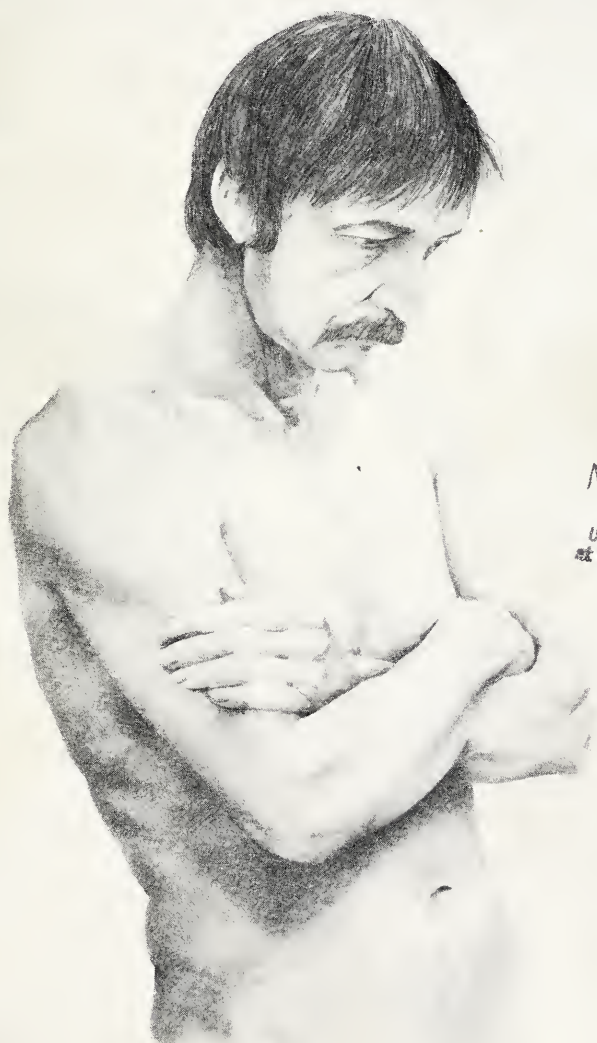OCT 28 1992

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view of Research in Visual Arts Education

Spring 1978   Number 8

Editorial Consultants

Review of Research in Visual Arts Education

Spring 1978   **Number 8**

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Editorial

The April 24, 1978 issue of the *Chronicle of Higher Education* published an article dealing with the overproduction of persons with doctoral degrees which we believe has relevance for individuals directing graduate programs in art education. One portion of this article described a study by the New York State Department of Education which provides a statistical base to reinforce the intuition we all have regarding the decreasing opportunities for the employment of doctoral students in higher education. This study indicated that in the 1980's, all of the academic jobs for persons with doctorates in the humanities could be filled by as few as six and as many as fifteen of the largest programs. In our view, doctoral granting institutions in art education should not only give a "hard look" at the consequences of overproduction of graduates, but also, at the quality of existing programs and the students accepted by these programs. It is worth noting that the 129 dissertations listed in the Dissertations Reported section of this and the last issue of the *Review* were granted by 58 universities. Considering what appears to be a reduced demand for doctorates in art education during the next decade and beyond, and considering the relatively small number of universities where the institutional mission, research support system and demonstrated faculty expertise clearly meet the requirements for sophisticated doctoral programs in art education, the profession must seriously question the need for this many institutions granting doctoral degrees.

This issue and others like it encouraged the editors to organize the first session of the Doctoral Advisers' Roundtable as part of the preconference meeting of the Seminar for Research in Art Education in Houston. The purpose of the Roundtable is to provide a continuing national forum for doctoral advisers and program directors to discuss issues related to the training of graduate students in art education. We are encouraged by the progress made at the initial meeting. The agenda for this meeting was ambitious and focused on four broad issues. They were: (a) the identification of priorities for basic research in art education; (b) the strengths of various doctoral programs in art education, related support facilities, faculty expertise, and funding sources for research; (c) the identification of similarities and differences among doctoral programs in terms of entrance requirements, program content, qualifying examinations, and evaluation of dissertation quality; and (d) the training of doctoral students for survival in a demanding academic marketplace. Each issue was examined in detail by sub-committees chaired by the following individuals: Ivan Johnson, Florida State University; Evan Kern, Kutztown State College; June King McFee, University of Oregon; and Ronald Neperud, University of Wisconsin-Madison. Committees are presently working on preliminary position statements which will be published in the Winter 1978 issue of the *Review*. More formal discussion about these issues will take place at the next session of the Roundtable in San Francisco next year.

Consistent with the notion that two heads are better than one, the editors will co-chair the preconference meeting of the SRAE in San Francisco and coordinate the research reporting sessions held during the conference. Information describing topics for the SRAE program and procedures for submitting papers for the research reporting sessions will be announced in a forthcoming NAEA newsletter. Incidentally, the annual award for excellence in dissertation research sponsored by the *Review* will be presented during the SRAE meeting.

From all indications, the *Review* is being well received by the profession at large. The budget and associated support facilities are firmly in place; individual subscriptions are up over a year ago; institutional subscriptions have more than doubled; and the content and format continue to mature. We believe that the *Review* is the best bargain in the profession. It needs and deserves your continued support. Please make it a point to return the enclosed subscription materials at the earliest date. This will save the expense of a second mailing.

Finally, we wish to encourage our readers to submit manuscripts to the *Review* for publication consideration. An original and three copies of each manuscript should be submitted to the editorial office. All manuscripts received by the editorial office will be submitted to three editorial consultants for review purposes before any action is taken by the editors. We look forward to your response.

GWH/TZ

TRIANGULATED INQUIRY: AN ALTERNATIVE METHODOLOGY FOR THE STUDY OF CLASSROOM LIFE

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The history of science is replete with examples of conflicting systems of knowledge that emerge within particular disciplines. During such conflicts, basic theoretic assumptions and presuppositions of the taken-for-granted research models, or paradigms, are questioned. Kuhn (1970) labeled such conflicts, "scientific revolutions." He built upon the notion that scientific revolutions are a natural factor for scientific advancement and demonstrated that science possesses built-in mechanisms that insure the relaxation of the restrictions that bind research, whenever the paradigm from which they derive ceases to function effectively. Led by paradigm change, scientists often adopt new instruments, and look in new places; but more importantly, during scientific revolutions, scientists often see new and different things when looking with familiar instruments in places they have looked before.

When a new paradigm is evoked, scientists will be reluctant to embrace it unless convinced that two all-important conditions are being met. First, the new candidate must seem to resolve some of the outstanding and generally recognized limitations of the existing paradigm. Second, the new paradigm must promise to preserve a relatively large part of the concrete problem-solving ability that has occurred to science through its predecessors. As a result, new paradigms often preserve, modify or build upon the concrete parts of past methods, while permitting additional concrete problem-solutions besides.

We find evidence for scientific revolution in the proliferation of competing philosophical debate over fundamental issues. Within the discipline of educational research is found a growing surge of discontent with the experimental methods adopted from psychology and the taken-for-granted paradigms derived from physical science. From this critical state emerges a climate for scientific revolution and for paradigm change.

The major assumption underlying this paper is that it is both feasible and necessary to develop alternative orientations toward data collection strategies which might research those questions which are less amenable to experimental design or pure statistical treatment. We need to develop methods to collect data related to discovering how the process of schooling interacts with the student's predispositions, purposes, assumptions, values, expectations and attitudes — or what I refer to as the participant perspective. My own research (Sevigny, 1977) has focused upon the study of classroom interaction in the university studio art classroom. To move toward a holistic understanding of studio classroom events, I developed a multiple methodology which I call *triangulated inquiry.* Triangulated inquiry represents one attempt to alter the traditional approaches to classroom investigation. In this paper, I offer a rationale for adopting such changes. Next, I explicate the features of some alternative practices adopted from the social sciences. And finally, I present the specific features of triangulated inquiry.

The Limitations of Traditional Observation Models

In their review of the research on teaching, Dunkin and Biddle (1975) concluded that most of the findings on achievement variables have minor significance and, in many cases, there is contradictory or "muddy" evidence. At best, those few positive findings can only be classified as "tentative." We know much more about the nature of instruction than we knew, largely because of researchers' development of classroom observational instruments. Yet, we know far less than many would have hoped about the relationship between student achievement and teacher/student interaction. Perhaps Rosenshine and Furst (1973) have a point when they suggest that we have spent too much effort in instrument development when our efforts would have been better directed toward testing the utility of those instruments for studying the social events which accompany instruction.

Researchers of student achievement have generally employed what has been called "a black box approach"; that is, operationally defining and crudely measuring an assumed linear relation between "input" and "output" variables. Their efforts have been "quantitative"; that is, rooted primarily in statistical theory and analysis. This may be because the kinds of questions they have been trained to ask are those which lend themselves to experimental testing and variable measurement. Research training, at the graduate level, has been grounded in statistical theory and quantitative strategies. Many social scientists have been critical of observational systems for their failure to provide qualitative data related to how the members of the classroom society construct interaction into mutually organized social activity. For example, Speier (1973) claimed that because systematic observers generally ignore such data, they have designed narrow classification schemes, adopted from informed learning theories. These theories in turn become the rationale for studying the classroom environment and provide the researcher with theoretical purpose and the means for generating hypotheses out of those purposes. Of the Flanders System (Flanders, 1970) he wrote:

> What is treated as a relevant problem of study are the types of teacher influence used in the classroom — is solved by quantitative inspection of the amount a teacher talks, a student talks, or the amount of silence of both. But what is amount of talk? The number of words per minute? The number of sentences? Is the teacher's silence equivalent to the student's silence? What is silence? Is it merely the measured interval of time between two uttered sounds? Or might it be something far more subtle, such as unwillingness to speak when called upon to do so, or a pause in the middle of one's remark that clearly belongs to that person and to that remark?

Speier underscores questions of a *qualitative* rather than *quantitative* nature — questions which should be answered if a complete (or "holistic") understanding of social interaction is to be attained. My own position would assert that neither approach used alone could be as effective as an approach which combines the two. That same belief was voiced by Margaret Mead (1976) when she wrote:

> We must come to realize that the extension into the human world of the methods of the physical sciences can be stultifying and dangerous. It is only when we realize that there are two distinct and complementary — rather than antagonistic — sources of knowledge that we can fully develop methods appropriate to each and consider how such methods can serve to support and reinforce each other.

The observer's capacity for subjective interpretation of human action is generally ignored in the methods systematic observers use to go about their recognition of specifically coded be-

haviors in the first place. The result has often been that coding systems use such overly generalized categories as "teacher asks question" and "student responds," which lend themselves primarily to frequency measurement and say nothing of the unique and qualitative dimensions of classroom interaction. Recognizing the importance of the subjective view is long overdue in education research.

The shortcoming of traditional observation systems is that they quantify through the screen of the observer and they do not qualify through the screens of the participants. Systematic observers have chosen to ignore the internal states of the participants of the classroom setting. Educational research is in need of a change in research methodology which would enable classroom investigators to collect subjective data.

In summary of the state of the art, I have found that the search for single variables to explain learning outcomes has to be less fruitful than a search for related, or clustered, variables. Past research has failed to map out carefully the complexity of classroom learning. It has proceeded too quickly to data processing before understanding the contexts against which the variables are considered. Past efforts have relied too heavily on available and popular instruments because they were convenient, not because they were the most appropriate to the real questions that were being asked. Although researchers may have considered qualitative questions, they have not attempted to find ways that such data could be made more amenable to analysis. Finally, they have failed to interface the quantitative and qualitative data having had little regard for the contributions each can make to the other. They have failed to perceive the strength that could be found in their combined capacity for rich description. Until educational research attempts to deal with such deficiencies,

any attempts to find causal explanations for schooling outcomes will remain primitive. My position is not that quantitative methods are not necessarily wrong, but used alone they are inadequate. The potential strength of a multiple approach will now be examined.

Qualitative Research

The task of the qualitative methodologist is to capture what people say and do as a product of how they interpret the complexity of their world. In order to grasp the meaning of a person's behavior, the qualitative researcher attempts to understand social events from the person's point of view — to gain understanding through the participant's perspective. Anthropologists often make use of the drama metaphor: the researcher, rather than appearing in the audience watching the drama unfold on stage, is himself on the stage, acting a role in the production, and interacting with the other actors. Research which examines phenomena from the actor's perspective is commonly referred to as "participant observation."

It is misleading to regard participant observation as a single method. Rather, in common parlance, it refers to a characteristic blend or combination of data collection techniques that are employed to study social phenomena in natural settings. That is, participant observation combines several methods toward a particular research end. That end is analytic description in the form of written accounts called "ethnographies." An ethnographic description employs concepts, constructs, propositions and empirical evidence, through thorough and systematic data collection, classification and reporting. What is reported are the unique variations of social phenomena as they have been observed or experienced in the actions and the language of the participating members.

Although the term "participant observer" is widely used in the social science literature, few attempts have been made to separate differences in the participant observation research stances available to scientific observers. The kinds of data researchers gather will depend in part upon how they participate in the setting. There are four possible research stances for the participant observer: the complete participant, the participant-as-observer, the observer-as-participant and the complete observer. My research makes use of a multiple comparative case study design which enabled me to study similar instructional events from the varying vantage points afforded by each of these four stances. It seems fair to say that in those few studies which have employed participant observation in classroom settings, researchers have generally assumed a stance of the observer-as-participant, or the complete observer. In most cases, it has not been feasible for the investigator to assume the role of a student participant.

There are at least three reasons for supplementing direct observation with student participant report:

1. The organization is typically being manifested in several locales simultaneously.

2. The organization has typically been in existence for some time before the scientist undertook his study.

3. Many of its features or determinants (i.e., motives, intentions, interests and perceptions of its members) are only imperfectly inferable by direct observation.

From the first two reasons we can see a need to supplement the researcher's own observation with indirect observation reports, which can only be obtained from perceptive persons who were on the scene in the scientist's absence. These persons are called "informants" and they must be carefully questioned for the researcher to piece together the facts and the validity of the informant's account. This particular field strategy is known as "informant interviewing." It is a regular feature of the participant observation methodology.

The need for subjective data emphasizes yet another reason for interviewing the members or participants concerning their motives, their intentions, and their interpretation of the events in question. This provides the investigator with a critical check on the validity of some of the inferences he makes about the subjective side of events. By assuming an active part in the relevant activities of the group, the participant observer is receiving the same socialization as ordinary members, and he acquires a perspective which allows for his successful participation. Consequently, he encounters similar events and experiences. In this way, the researcher acquires some sense of the subjective side of the events which he could less readily infer if he observed without taking part. Having become a part of the phenomena, the researcher has attained personal knowledge and the question of validity is not tested against the corpus of scientific knowledge but against the everyday experience of a community of people.

Although the active participant observer can acquire some sense of the subjective side of experience, this sense still remains his own and it cannot be assumed to represent that of others. Informal interviewing of the feeling states of other participant members of the same setting is necessary to supplement, or to validate the generalizations which the members hold. The research function of the empirical observer's participation is to bring to an awareness the subjective issues which can be probed through informal interview of the other responders in the setting. This particular research technique is known as "respondent interviewing." Both "informant" and "respondent" interview data are central to a triangulated methodology.

The qualitative observer may also collect a variety of other data for use in his final analysis and ethnographic account. These data may include: personal documents, diaries, photographs, video or audio recordings, institutional records, sample products or anything which may be potentially useful to holistic assessment. Each of these may prove to be particularly important in obtaining a particular type of information in gaining a richer understanding of complex social events (see Webb et al., 1966).

Those committed to preserving the integrity of the situation maintain that any face-to-face situation is of importance in and of itself in determining the meaning of what goes on in that situation. Concrete human events are always to some degree dependent upon the situational context in which they occur and can be explained only through the perceptions shared in the situational context in which they have taken place.

A holistic account demands a multiple methodology, which can provide a variety of interrelated data as well as produce multiple perspectives. A particularly strong holistic orientation is found in the approach taken by a branch of social research known as "ethnomethodology."

Ethnomethodology

The term, "ethnomethodology" was first coined by Garfinkle (1967) to refer to the shift in attention toward investigations of the production practices — or the "doings" — which constitute the "social order" of particular social encounters. The research interests of ethnomethodologists are the regularities and changes in selected features of behavior that are meaningful to the individual members of a social setting. In social settings, actions do not occur as isolated events but rather, are linked to each other as one member responds to and anticipates the actions of others.

Any particular action, then, is embedded in a process of interaction involving several participants responding to each other's actions.

As a basis for interaction research, ethnomethodology offers educators an alternative paradigm for investigating the classroom setting. Ethnomethodological data collection incorporates a variety of qualitative methodologies, including those of participant observation. A difference, however, is found in its underlying assumptions and the basic theoretic stance it takes toward social interaction.

The philosophical features of an ethnomethodological stance are derived from the work of Alfred Schutz (1966) who translated Husserlian Phenomenology from its epistemological concerns to sociological ones. The central features of Schutz's writings form the basis of the theoretical structure of all phenomenological sociology, and of ethnomethodology in particular. Schutz focuses on the "actor's" devising of conduct through what is called "intentionality." Intentionality takes on meaning according to the actor's system of relevance and the purpose at hand. Therefore, it is a subjective and unique to the individual's biographical situation. In order to understand social interaction, the actor must be able to "typify" the actions of those with whom he interacts. Schutz (1953) labeled this phenomenon the "reciprocity of motives." The assumption made is that motives of another are typically the same as one's own would be in similar circumstances. This human capacity for typification allows us to anticipate the actions of others and to give meaning to everyday encounters. Schutz's conception of the typification process asserts that all knowledge of the world involves interpretive constructs sets of abstractions, generalizations, formulizations — each specific to a retrospective level of thought. All thoughts originate from

schemes of reference and are interpreted as "facts."

The ethnomethodologist is not concerned with the discovery of facts but rather with the question of how people do account for facts within particular settings. Their basic assumption is that individuals have meaning structures which allow them to operate on a social level. Furthermore, those meanings are believed to be contextually related to the events in which action occurs. A research question which investigates the interpretation and meaning that participants give to social interaction is clearly an ethnomethodological problem.

Returning to Garfinkel's development of the ethnomethodological stance, we find a second major premise extensively expressed throughout his writing — the "documentary method of interpretation." Documentary methods of interpretations are the member's way of giving structure and order to a social reality. Ethnomethodologists seek to describe the documentary method by participating in the daily life and focusing their attention on what is normally taken for granted by the participants. They refrain from judging the adequacy or predicting the consequences of a member's account. Ethnomethodologists seek to describe social situations to gain understanding of how the members of a setting go about *constructing* and maintaining social reality. They examine, then, a multiple interpretation of a social event.

Of fundamental concern here is the question of how order and meaning can be produced. The answer to these questions has been said to be found within "rules," "norms," and "definitions." While ethnomethodologists are concerned with these topics, they make a distinction between the "basic rules of everyday life" and the "normative rules of conduct." In the classroom, for example, the "normative rules" would be the sanctioned standards of the teacher or the group, while the "basic rules" would be the underlying and informal structure which allows individual members to make action choices toward or against the normative structures. Garfinkel (1963) labeled these, "constructive expectancies"; that is, the underlying expectancies which allow for the construction of social interaction.

Social order in the classroom exists as an emergent phenomenon, having no existence apart from the member's accounting and describing practices. It is upon this point that ethnomethodology departs from traditional sociology. Ethnomethodology views moral order as a set of background expectancies — as a general scheme of interpretations. Rules are not altogether normative, but, are quite problematic for the participant who must employ everyday logic or knowledge to determine whether the rule is appropriate to the situation. This, then, is the dynamic process by which "norms" become constructed and situationally interpreted, evaluated, and applied to social events.

It would be emphasized that ethnomethodology is not an alternative sociology aimed at a more efficient solution to traditionally formulated social problems. Its very existence was stimulated by a new set of research questions and a new set of theoretical assumptions. As such, ethnomethodology must be viewed as a scientific enterprise which is separate from, yet a part of, the larger discipline of sociology.

In summary of the essential features of an ethnomethodological stance, it can be said that:

1. Reality is interpreted rather than discovered; that is, reality is socially constructed and maintained.

2. Human behavior is rule-guided and rational.

3. Human behavior is typified according to its biographical and contextual level.

4. Basic rules, or background expectancies, form the structural property of social acts.

5. Background expectancies are the basis of valuation and moral order, and although interpretation of this moral order is problematic, individuals are motivated toward compliance with their definitions of legitimating that order.

6. Social settings are self-organizing; individuals work to eliminate inconsistencies and discrepancies that arise in the setting.

7. Social structures and organizations are emergent products of the perceived orderly features of interpersonal events.

Triangulated Inquiry and the Temporally Developing Design

My notion of "triangulation" involves an ethnomethodological orientation and combines multiple case study investigations, multiple strategies for data collection, multiple strategies for data processing, and multiple strategies for data analysis. The notion of triangulation is not entirely novel. Beittel (1973) referred to a method he called the "Roshomon Effect"; Lewis (1961) developed the stance he called "The Multifaceted Panoramic View"; and Cicourel (1974) promoted the concept of "Indefinite Triangulation." These proposed methodologies call for multiple comparisons of a single phenomenon, group, or unit at two or more points in time or purport to use multiple perspectives to measure a single phenomenon at a single point in time. To expand the concept what I propose is the comparison of several groups using varied perspectives and multiple procedures at two or more points in time.

What triangulated methods assume is that when a singular method or perspective is used as the absolute measurement, the researcher, in effect, has isolated his case study to an abso-lutism that reduces its potential for generalizability beyond its own context. What triangulated inquiry can offer is a stronger foundation for generalization through built-in mechanisms which rule out rival hypotheses and, through cross-validation strategies, researchers can design unique means for internal replication.

A triangulated approach asks whether other plausible interpretations are allowed from differing participant perspectives, while at the same time it can allow for cross-validation measurement operations, including the mesh of quantified and qualitative reports (Glasser and Strauss, 1965).

Constant reflexive comparisons quickly draw the researcher's attention and awareness to similarities and differences among groups, enabling faster emergence of categories and the speedy generation of more plausible hypotheses. In contrast to most methodologies in which the researcher's special interests and investigation goals are determined a priori, a research design using triangulated methods remains flexible up to and including the initial stages of the field research. While a researcher may have strategies to follow, the specifics of his approach evolve as the investigation proceeds. I refer to this as the *temporally developing design.*

What distinguishes triangulated inquiry from other research is that the initial research questions are framed in general terms. Practitioners enter the research setting without specified hypotheses. They believe that to enter with a set of specific hypothetical expectations is to impose preconceptions, and perhaps misconceptions, on the phenomenon and on the setting. Consequently, the designs used by qualitative researchers are open, general and flexible in their initial implementation.

The aim is to discover the interacting multiplicity of variables. Initial obser-

vation is guided mainly by sensitivities to data derived from both professional background and general notions about the nature of the research setting. As the researcher becomes increasingly aware of the setting, the relevance of a large number of hunches about relationships are tested.

During the second phase of fieldwork, the investigator begins to categorize and organize the massive flow of observed events. The analysis of field notations is an integrated and ongoing part of the research procedure. Significant classes and subclasses are differentiated within the general phenomenon. As classes emerge, some became more important than others and the initial research focus often undergoes considerable revision. That is, as the research progresses, attention narrows toward the particulars — the fine-grained aspects of interaction events.

A final stage in the research consists of an effort to identify relationships among the emerging categories. By this time, the number of propositions has dwindled considerably. Some are short-lived, proving to be inconsistent or incorrect; others are simply lost sight of, or set aside, as the more significant or interesting ones become the focus of analysis.

My investigation began with general exploration of interaction phenomena and gradually refined its focus toward the description of the keener qualitative dimensions of instructional appraisal. The actual investigation progressed through four distinct phases and seven case study observations.

The aim of my study was to gain holistic understanding of aesthetic performance evaluation. Phase I consisted of a series of five exploratory investigations which served to expand understanding from the *triangulated perspective* of (a) the artist, (b) the beginning student, and (c) the studio instructor. The second phase involved systematic collection of descriptive data from the four differing participant observation stances. The third phase expanded the triangulation through multiple processing of the data. The final phase incorporated multiple strategies for analyzing and reporting the descriptive data.

Interwoven throughout the seven observation studies was a conscious attempt to attend to what Harris (1968) referred to as the "emic/etic analytic." The "etic" perspective has come to mean an approach coming from outside the system being studied. An "etic" approach to research derives its constructs from scientific theories, external to the phenomena and previous to their investigation. Phenomenal distinctions and sub-classifications are those already accepted by the scientific community. Systematic observation which employs standardized category classification falls squarely within an etic approach of scientific investigation.

On the other hand, an "emic" approach is concerned with the study of behavior from the perspective of the participants — from inside a single, culturally significant unit. Criteria are used in an emic description that are drawn from contrasts made from within the system itself and are relevant in terms of the internal functions, interpretations and meanings for the participants themselves. Participant observers make use of the "emic" approach in that they focus upon the purposes, goals, motivation, attitudes and interpretations of the participants of social phenomena. Qualitative research methods are premised upon the assumption that given a choice between the participant and the observer, it is the participant who has better access to his own inner state. It is further assumed that knowledge of that inner state is an essential factor for holistic understanding of interpersonal events.

Although the real-world distinction between the emic and etic perspective is not always as clear as the simplified
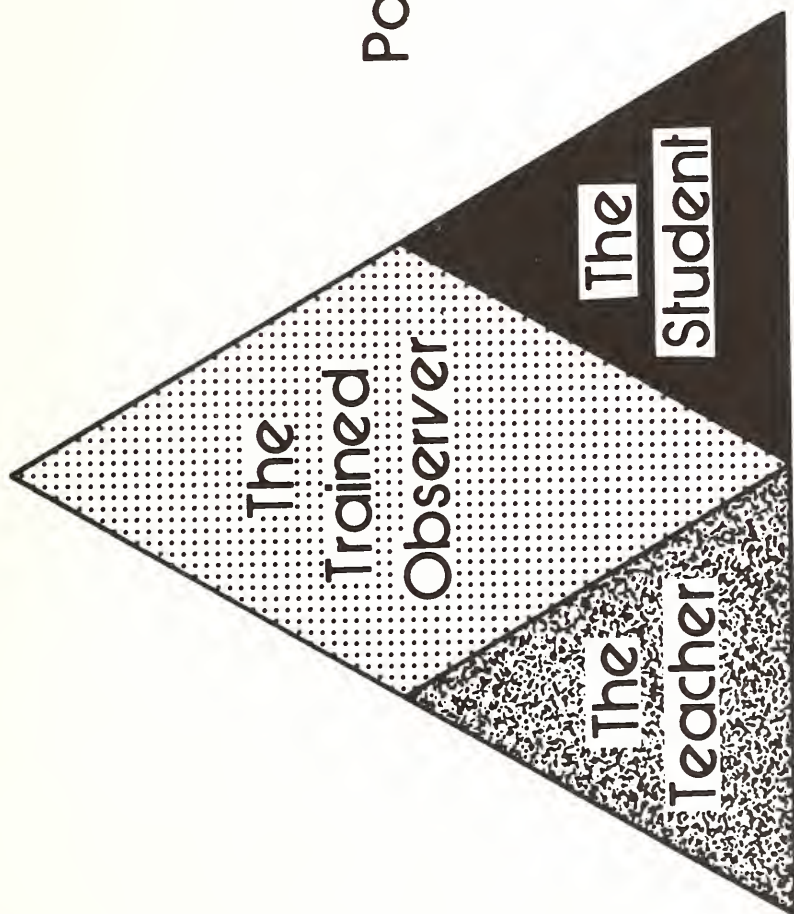
1 THE TRIANGULATED PERSPECTIVE

Full Observation

Elic

← Participant Observation →

Emic

Full Participation

The Trained Observer

The Teacher

The Student

construction just presented, the distinction can provide a practical framework for structuring participant observation research. In my own research, it provided yet another device for triangulating the observation data. The etic perspective served as the entry framework which allowed me to begin the task of organizing my observation perceptions into classes of behavior. As I became more aware of the internal orderings (the emic perspective) I could alter, modify or build upon the initial classification scheme, thus refining the classification and description of social phenomena into a blend of both the emic and the etic perspectives. Separating each field investigation, and interwoven throughout them, was a conscious effort for formal study of the etic perspectives offered in areas such as cultural anthropology, motivational psychology, linguistic analysis, social interaction, systematic instructional observation, symbolic interactionism, cognitive psychology, creative development and learning theory. Formal study and reading in these areas served to refine the observation focus and research questions for subsequent field investigation. Similarly, the participant observer investigations raised further theoretical questions and suggested areas for further related reading.

The purpose of the active participation of Phase II was to obtain qualitative data and record ethnographic descriptions of representative appraisal events. To accomplish this, I initially assumed a hidden observer stance as a university student participant. In the final case study, full observation and participation as observer were employed. In both data collection situations the teacher/subject remained the same; what differed was the observation stance. Initially, the observation was focused on my own participation in the setting. In the last study, observation was directed toward systematic observation of behavioral differences of earned grade achievement types.

To achieve a triangulated perspective, data were collected using three observational approaches: participant observation, systematic encoding, and informant ethnographic observation. During the 10-week observation period, teacher/student evaluative interactions were audio recorded, instructional patterns and events were described, and, the subjective interpretation of the meanings of those events were collected through interviews with the teacher and representative students. The features of the scene attended to and recorded included, among other things: descriptive accounts of interactive evaluative events, their historical continuity, their structure and explicit rules, the informal and implicitly-interpreted rules, the activities and relationships within those rules, and the ascribed and achieved status of the participants. These were the features of the studio classroom setting which the participants constructed and maintained.

As the term progressed respondent and informant interviewing became the focus of data collection. All participants were periodically interviewed. At the conclusion of the term summative reflexive interviews with every participant were tape recorded and transcribed. The earlier exploratory investigation from the student and instructor participatory perspectives enabled me to establish the conceptual unity of the three forms of observation data. The triangulated perspective was achieved through a combination of respondent and summative interviewing; and finally the ethnographer-observer perspective was accomplished through the multiple methods of direct observation, ethnographic field notation, interactive event analysis — through systematic observation and interaction encoding.

Triangulated processing was used to categorize the data for analysis and to facilitate the retrieval of data in the descriptive reporting phase. The qualitative dimensions of instructional

2 TRIANGULATED DATA COLLECTION

Enumeration and Samplings

Introspection and Participation

Field

Notation

Respondent and Informant Interviews
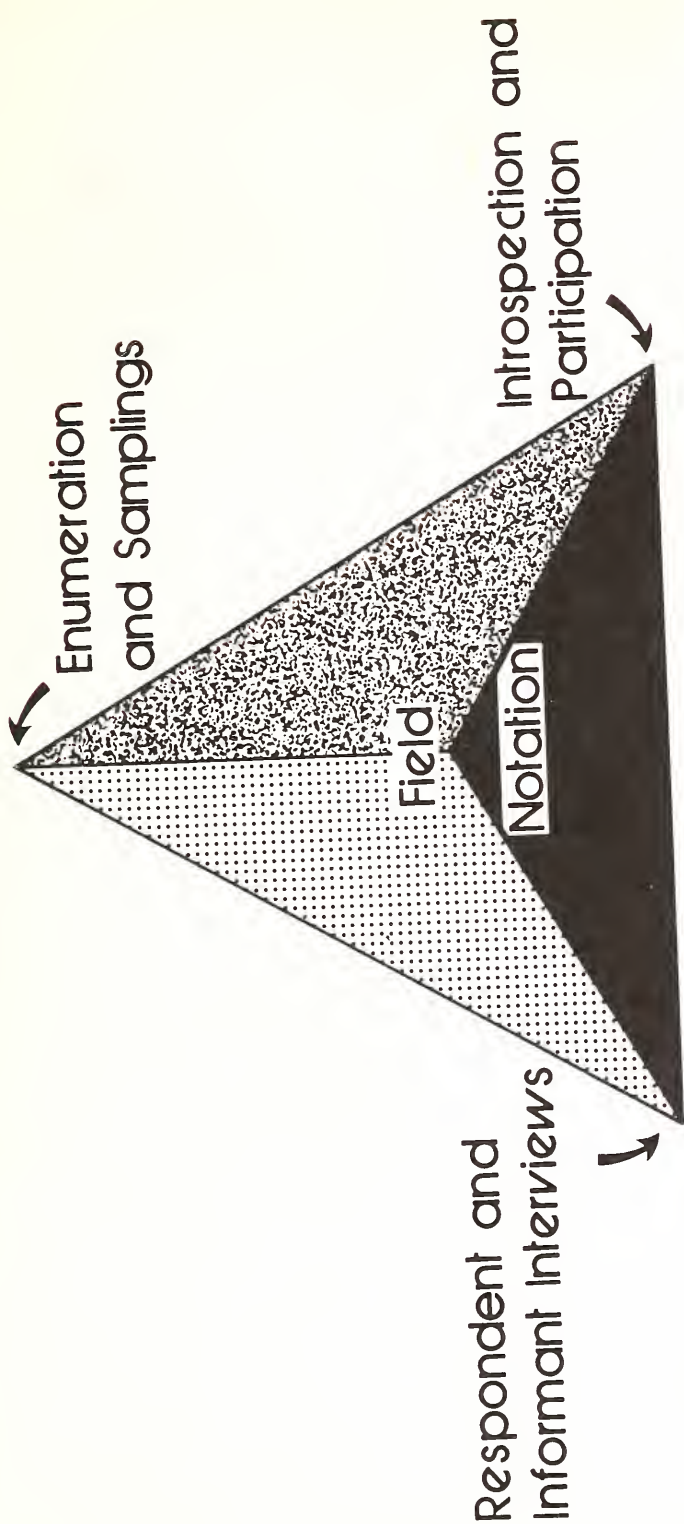
3 TRIANGULATED DATA PROCESSING

O.S.I.A. Encoding   Conversational Coding

Qualitative

Quantitative

Zetacoding

events were classified into a category system of 114 subscripted classes for use with the Observational System for Instructional Analysis (O.S.I.A.), designed by James Duncan and John Hough, of the Ohio State University. The subscripts functioned to quantify these qualitative discriminations discovered through direct participation. This strategy facilitated the analysis and comparison of behavioral pattern differences in the teacher/subject's interactions with students earning different achievement grades. Thus data collection was accomplished in three stages: event recording, event encoding, and event discrimination analysis through tabular display.

To use audio recordings for analysis, the researcher is faced with the problem of sound quality and the adequacy of audio "pick-up." Good quality sound transmitting and receiving equipment is essential. To increase the quality of audio recording, the subject was equipped with a transmitting wireless microphone to hear all the audio transactions related to in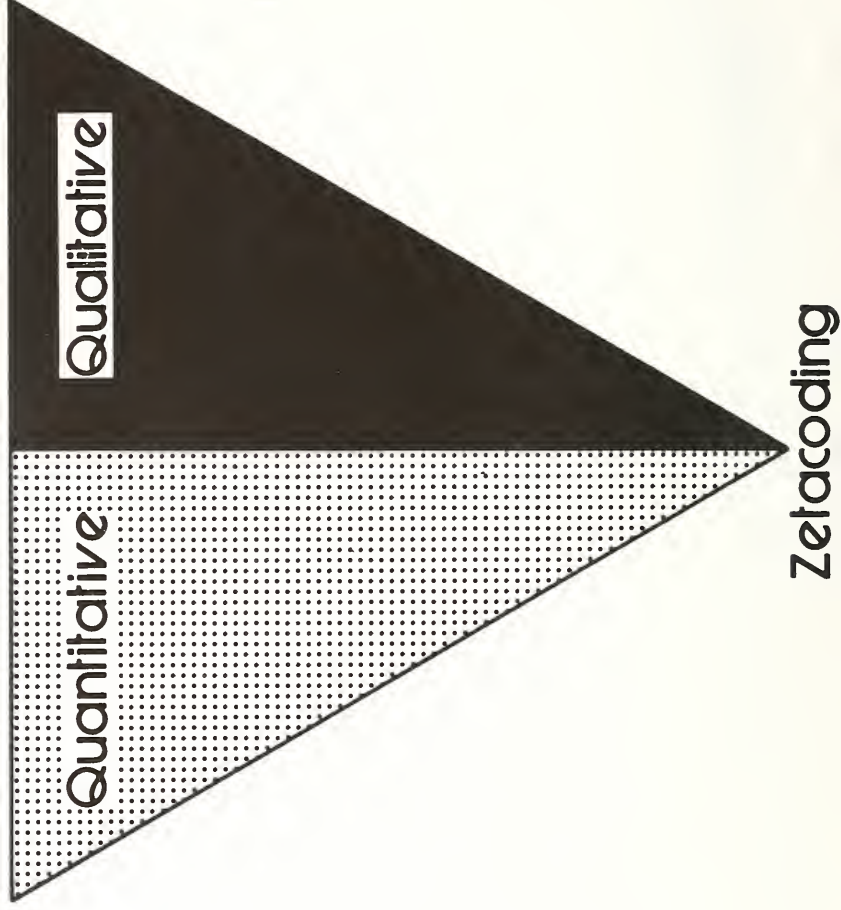structional events, including the more "private" transactions with students. When the focus of observation is tutorial interaction, this strategy is essential for accurate recording of everything that the teacher and student say.

Though the technological aspects of recording interaction can be maximized for efficient and accurate recording, audio recording alone does not "capture" significant gestures, nonverbal responses, or the related aspects of communication phenomena which are visually detectable, but silent. What is lost are significant qualitative variations of interaction behavior. To compensate for this limitation, I recorded nonverbal and qualitative dimensions through ethnographic description using a dual track recording feature. The procedure employs a reel-to-reel recorder with a stereo dual-track recording option, an amplifier

and a wireless transceiver. Classroom verbal interaction is recorded through transmission from a wireless mike worn by the subject. For ethnographic reporting, the investigator is equipped with a whisper-sensitive mike, so that his descriptive input can overlap the event actual transaction. The sensitivity of this equipment made it possible to describe transactions unobtrusively. The dual-track feature allowed for simultaneous playback as well as isolated listening for transcription purposes. Qualitative inserts proved invaluable in the post-field analysis and interpretation of the verbal transactions.

To accomplish a *triangulated analysis* of the data, three major types of analyses were performed: (a) Event Interaction Pattern and Standard Variable Analysis, (b) Nonverbal Communication and Conversational Structuring Analysis and (c) Ethnomethodological Notation Analysis. Utilizing the triangulated approach enabled me to blend qualitative and quantitative data to extrapolate and organize the essential features of studio classroom appraisal into a richer descriptive account. The synthesis from multiple perspectives and multiple cases, allowed for a holistic grasp of classroom phenomena that would not be possible from a singular observation stance or through a singular research strategy.

A triangulated methodology also has limitations and design implications for researchers who may be contemplating the adoption of this approach. Holistic assessment takes as its problem the nature of the total system, rather than a particular process or variable within the system. Such a goal results in a mass of data and demands awesome amounts of time for its processing and analysis. Triangulated inquiry employs multiple operations each of which is, in effect, a small study with a research design of its own, but each of which is important and holistically related to

4 TRIANGULATED DATA ANALYSIS

Interview and
Conversation Analysis

Event Interaction
Analysis O.S.I.A.

Ethnomethodological
Analysis
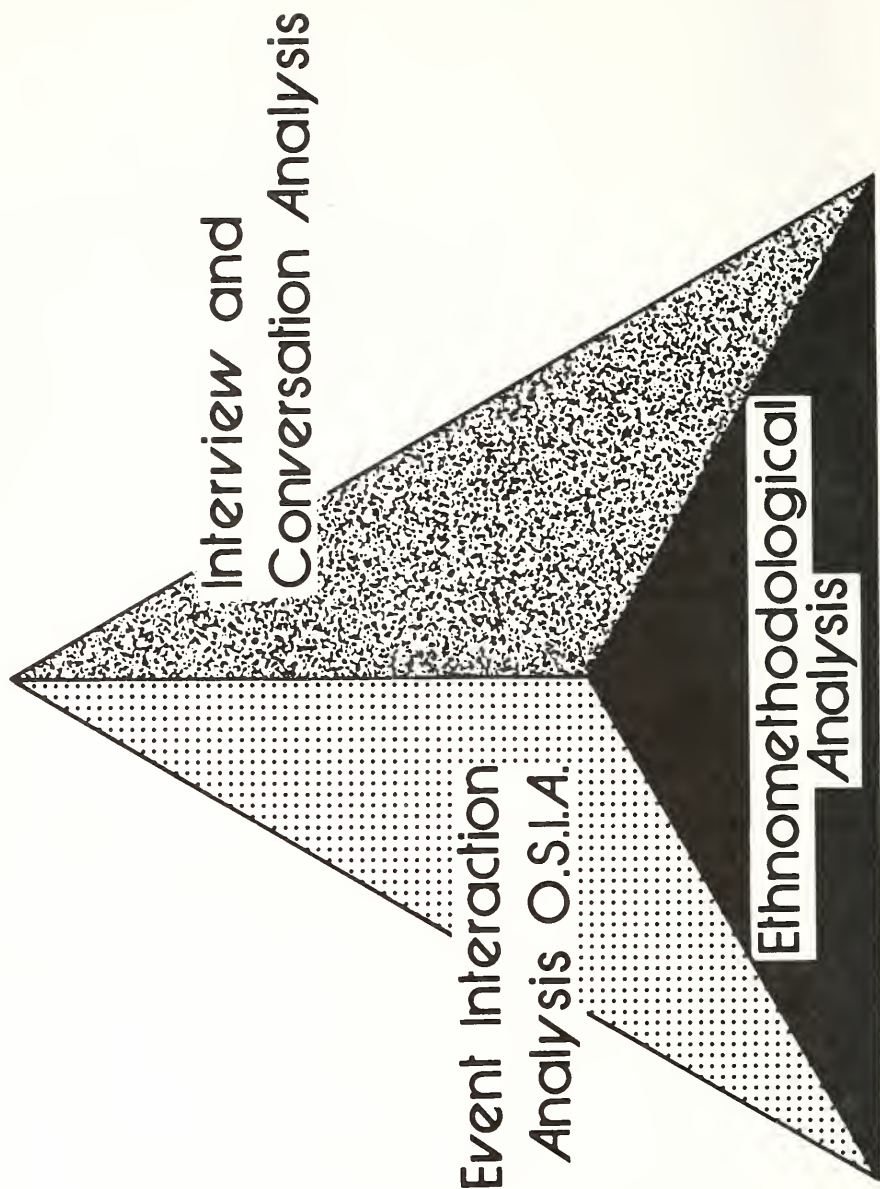
others. It is difficult to present any one of these "sub-studies" in isolation from the others to which they are intricately connected. The reliance upon triangulated data confronts the investigator with unusual problems of bulkiness in his reporting. Tabular summaries did facilitate the reporting by effectively consolidating classroom behavior. However, the flow of descriptive reporting is easily broken when tables are introduced. The writer is faced with a task of artfully weaving the tabular displays and the very telling and discrete qualitative incidents into a large and coherent pattern that communicates persuasively.

A temporally developing design, by its definition, demands a lengthier investigation period. My study evolved over a period of four years of intensive field operations and analysis. Such temporal factors should be weighed. In addition, triangulated inquiry demands a wider range of investigative skills, and, its potential for problem solving depends upon the creative imagination of its implementer. Discovery rests with the insightful perceptions and ability to make "key linkages" among isolated observation variables. Hence, the methodology is not appropriate for every researcher but rather for those with confidence in their capacity for creative problem solving.

Summary

Too often, a methodology is perceived to equal "research." The position developed in this paper asserts that no singular methodological paradigm is best and perhaps the most fruitful strategy for classroom inquiry will result from multiple operations and combined paradigms. This paper addresses that conviction by developing the concept of "triangulated inquiry." It began with an overview of perceived limitations of singular methods for studying the complexity of classroom life. Special attention was then given to the methods of the participant observer and the philosophic stance of the ethnomethodologist. Relevance was established for multiple observation perspectives, multiple data collection procedures, multiple data processing strategies and multiple analysis procedures. Triangulated inquiry is not promoted as the ultimate methodology but rather as a creative alternative for the study of classroom life.

Any research strategy is bound to have limitations or imperfections. Triangulated inquiry is no exception. I submit however that this effort has been sincere in its attempt to expand the accepted boundaries toward newer directions. Perhaps the imperfections or limitations that the reader may perceive will stimulate the development of alternatives that, heretofore, were beyond the conceptual range of what was understood as "research." This is not only the challenge of this paper, but its hope.

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A FACTOR ANALYSIS OF VISUAL, KINESTHETIC AND COGNITIVE MODES OF INFORMATION HANDLING

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The purpose of this study is to derive factors in which dimensions comprise the modes by which information is handled in an art context. The problem to be investigated is to determine whether common factors exist among the dimensions that comprise the modes of information handling. If the results of the investigation are affirmative, the amount of common variance due to each factor will be determined. This study is limited to factor analysis and rotation to the criterion of correlation of 23 dimensions sampled from the diverse characteristic modes of information handling utilized by students of the eighth grade level. A targeted rotation will be conducted to determine if the theoretical target matrix represents factors hypothesized as visual, kinesthetic (qua haptic), and cognitive.

In an art classroom, development and growth encompass the self identity and well being of the child, including maturation of the child's as yet unidentified and diverse modes of handling information. Therefore, it is a paramount requirement in an art classroom that the teacher recognize the dimensions that a child uses in handling information. Although the domains in which art objectives are often stated present dimensions which are difficult or impossible to define and measure, it would appear reasonable to assume that a better understanding of the various dimensions that make up information handling would help identify the child's total experience and create art experiences to fit the whole child cognitively and affectively.

Apparently, no study has been conducted to ascertain whether shared abilities exist among the modes that comprise information handling in an art ambience. Thurstone (1947) identified three primary mental abilities but these had little if anything to do with affective or visual dimensions as Lowenfeld described them in an art context.

Statements in the literature (McFee, 1970, Goodenough, 1926, and Harris, 1963) indicate that there appear to be at least three primary modes of information handling: visual, affective (qua haptic) and cognitive (conceptual).

McFee (1970) further stated that the fundamental unity by which the dimensions involved in perceptual modes are attended to by the child in information handling are through the processes of thinking, perceiving, becoming aware, relating, differentiating, arranging, and innovating. It is through percepts and, especially when delineation is involved, through kinesthesis, that the process of information handling is accomplished. Factor analysis, in this study, may identify the factors involved.

Related Research

Lowenfeld (1964) postulated that the child utilizes two opposing modes of perceptual orientation that are innate dimensions, "visual" and "haptic." A third mode described as "not identifiable" was the indefinite mode. Lowenfeld did not mention cognition as

a possible mode of perceptual orientation.

According to Lowenfeld, the visual mode of information handling referred to characteristic dimensions in which individuals depend on their eyes as intermediaries for visual impressions. Such individuals are concerned with objective analyses of visual details; they are the analyzers.

Muscular sensations, touch impressions and experiences derived from body sensations are the dimensions Lowenfeld (1964) stated were descriptive of individuals who utilize haptic modes.

In this study, the word kinesthesis was substituted for the word haptic since kinesthesis has reference to a deeper, inner sensation attending movement of any member of the body which arises from stimulation of special receptors in the muscular tissues, joints, and tendons. Hapticity has a more limited connotation, referring primarily to the peripheral sense of touch.

Evidently Lowenfeld implied that there were intercorrelations among the five tests he devised to identify the visual and haptic modes of perception. However, no actual statistical correlations either in terms of reliability or validity were ever reported by Lowenfeld.

Wiggin subjected Lowenfeld's tests to a reliability and validity test; the tests were reported as having $-.04$ correlation and low reliability and validity.

In 1948, The Ryerson Institute of Technology, Toronto, Canada, under the sponsorship of the Ontario Department of Education as reported by Gaitskell and Hurwitz (1970) concluded that the visual, haptic, and indefinite types did not appear in the percentages similar to what Lowenfeld reported, i.e., 47% of the children were visually oriented; 23% were haptic; and 30% were not clearly identifiable. But the Ryerson study did find a working differentiation of Lowenfeld's types of modes of information handling.

Gardner's 1959 study indicated that cognition as a mode of information handling could be thought of as the interaction between the dimensions that make up both conception and perception. Together conception (the process of knowing) and perception comprise autonomous dimensions within the cognitive mode that guide the individual in determining to what will be attended.

Gardner concluded from his factor analysis of cognitive dimensions that the dimensions that comprise the cognitive principles were independent of each other.

Rouse (1965) studied the relationship between Lowenfeld's visual-haptic modes of expression and Witkin's field dependent-independent types. She found that subjects whose scores classified them as field independent (analyzers) and who were expected to demonstrate an objective mode of perception, instead showed a subjective mode of perception. This was an unexpected relationship; children who handled information by way of the haptic mode on one occasion were apparently visual in conception on other occasions. A similar crossover of dimensions that comprise the cognitive controls was found by Gardner.

Procedures

Subjects, age 11-13, were randomly selected from the eighth grade of the Bloomington Junior High School, Bloomington, Illinois. There were a total 103S, 52 were males and 51 were females; 23 tests were given to all the Ss.

The following visual-kinesthetic tests devised by Lowenfeld were administered (see Appendix).

I. Factor K-I: Kinesthetic-Indefinite
  Tests: 1. Matching Pairs of Figures (K-I-M)
         2. Test of Tactile Impression (K-I-T)
II. Factor V-I: Visual-Indefinite
  Tests: 1. Visualization of Kinesthetic Experience (V-I-V)
         2. Test of Integration of Successive Impression (V-I-I)
III. Factor V-K-I: Visual-Kinesthetic-Indefinite
  Tests: 1. Gerund Test (G-V)

It must be acknowledged here that factors as such have never been identified based on Lowenfeld's visual-kinesthetic tests; also, a factor analysis of these tests has never been conducted.

It is assumed that the tests that measure the dimensions that comprise the visual-kinesthetic modes of perception would produce factor loadings on the specific mode involved. Therefore, Visual-Kinesthetic-Indefinite factors were postulated and the tests that would correspondingly produce factor loading on the modes are listed above.

In his 1960 study, Flick described 14 pairs of geometric forms cut out of ¼-inch masonite that were used. These forms were drawn to exact scale and were used in this study; the forms are shown in the Appendix.

French et al., (1963) list the following group of familiar cognitive tests under the following factors. These tests were also administered to the Ss of this study.

IV. Factor Cf: Flexibility of Closure
  Tests: 1. Hidden Figures Test (Cf-1)
         2. Hidden Pattern Test (Cf-2)
V. Factor Cs: Speed of Closure
  Tests: 1. Gestalt Completion Test (Cs-1)
         2. Concealed Word Test (Cs-2)
VI. Factor Ma: Associated (Rote) Memory
  Tests: 1. Object Number Test (Ma-2)
         2. First and Last Name Test (Ma-3)
VII. Factor P: Perceptual Speed
  Tests: 1. Number Comparison Test (P-2)
         2. Identical Pictures Test (P-3)
VIII. Factor Ss: Spatial Scanning
  Tests: 1. Maze Tracing Test (Ss-1, part 1)
         2. Maze Tracing Test (Ss-1, part 2)
IX. Factor V: Verbal Comprehension
  Tests: 1. Vocabulary (V-1, part 1)
         2. Vocabulary (V-1, part 2)
X. Factor N: Number Facility
  Tests: 1. Subtraction & Multiplication Test (N-3, part 1)
         2. Subtraction & Multiplication Test (N-3, part 2)

An additional test, the Physiognomic Cue Test, was administered.

XI. Factor As: Affective State
  Tests: 1. Physiognomic Cue Test (PCT, part 1)
         2. Physiognomic Cue Test (PCT, part 2)

All 103 subjects were given the above tests measuring, according to the authors, visual-haptic or cognitive abilities. The total of 23 basic scores for 103 subjects produced an intercorrelation matrix of 253 product-moment coefficient correlations (r). Unity was inserted in the principal diagonals of the intercorrelation matrix. The number

of factors that were extracted was guided by the eigenvalues or latent roots plus exploration; that is, the ideal number of factors that were rotated were *post hoc* determinations.

Most of the tests were 2 to 5 minutes long. The testing time for each subject was 180 minutes. This time was subdivided into no more than 30 minutes per test period.

Results

A 23 x 23 matrix of intercorrelations was constructed. The Biomedical Factor Analysis Computer Program (BMDØ3M) was used in this study. A rotated factor matrix was obtained by using the varimax criterion (Guertin and Bailey, 1970); the rotated factor matrix with loadings, means, standard deviations, and communalities are presented in Table 1. In order not to collapse the factor space into a space less than the space of the meaningful factors, the factors were rotated a number larger than three factors to ascertain how the loadings of the variables would be dispersed. Rotating in a common factor space of six, five, and four did not significantly vary the factor loadings as shown in Table 1. A minimum number of factors to account for the intercorrelations were extracted and found to be three. The three factors A, B, and C were designated cognitive, visual and kinesthetic respectively. Some unexpected loadings took place; the Maze Tracing Tests, variables 11 and 12, along with four of Lowenfeld's Visual-Kinesthetic Tests, variables 19, 20, 21, and 22, all loaded on Factor B.

Since the contribution each factor makes to the total communality is simply the sum of the squares of the

TABLE 1

Rotated Factor Matrix with Loadings, Means, Standard Deviations, and Communalities

| Variables | | Factors | | | Means | S.D. | h^2 |
		A	B	C			
1	Age	−.48	.11	−.01	166.50	6.46	.25
2	I.Q.	.74	.13	.07	102.20	14.39	.59
3	Cf-1	.22	.02	.03	3.28	1.65	.08
4	Cf-2	.38	.16	.13	83.29	24.05	.24
5	Cs-1	.18	.23	.06	6.71	1.82	.15
6	Cs-2	.27	.02	.05	11.76	2.96	.11
7	Ma-2	.25	−.04	−.15	6.52	3.07	.16
8	Ma-3	.68	−.07	.01	8.05	3.75	.60
9	P-22	.35	.18	.39	21.88	5.54	.48
10	P-3	.26	.12	.32	31.83	7.78	.30
11	Ss-1-1	.19	.69	−.10	8.84	3.02	.58
12	Ss-1-2	.13	.78	.02	11.60	3.50	.65
13	V-1-1	.49	.12	.00	7.18	3.69	.44
14	V-1-2	.39	.19	.05	6.57	3.41	.31
15	N-3-1	.65	.06	.11	18.38	7.50	.48
16	N-3-2	.59	.02	.19	18.76	7.70	.46
17	PCT-1	−.04	−.10	0.76	60.21	9.88	.59
18	PCT-2	−.11	.10	−.76	58.22	10.76	.59
19	K-I-M	.00	.53	−.04	35.94	12.65	.42
20	K-I-I	.16	.30	.23	109.63	43.93	.23
21	V-I-V	−.08	.48	.03	69.67	26.22	.36
22	V-I-I	−.01	.34	.17	45.67	24.55	.27
23	G-V	−.03	−.18	.19	37.00	7.10	.18
	Vp	53.8%	26.0%	20.2%			

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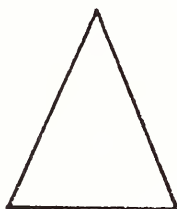
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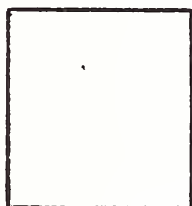
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VISUALIZATION OF KINESTHETIC EXPERIENCE
Test 21 (Sample)
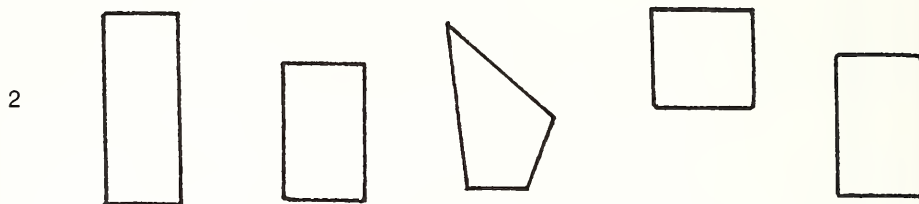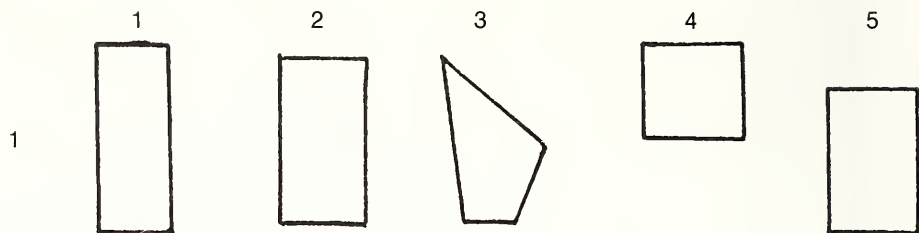
TEST OF INTEGRATION OF SUCCESSIVE IMPRESSION
Test 22 (Sample)
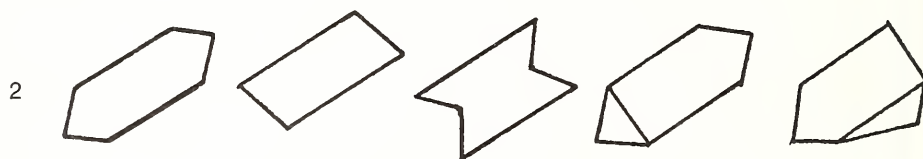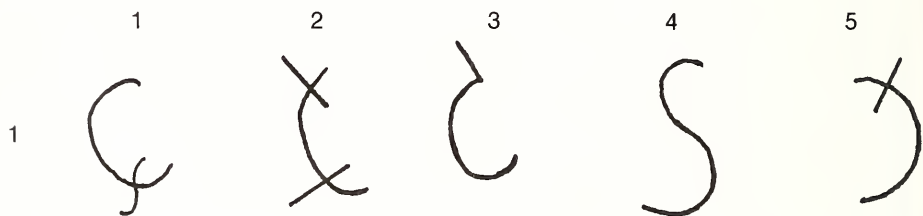
factor loadings of each factor, the following percentages were reflected. The cognitive factor accounted for 53.8% of the total communality; the visual factor, 26%; and the kinesthetic factor, 20.2%. These were the proportions of common variance (Vp) that were accounted for by each factor in all the tests combined; the proportions of common variance are indicated in the last row at the bottom of each column in Table 1.

As expected, the variables that best represent the cognitive factor were I.Q. (2), First-Last Name Test (8), and Subtraction-Multiplication Tests (15 and 16). The variables that best represented the visual factor were the Maze Tests (11 and 12) and Lowenfeld's tests (19, 20, 21, and 22). These latter loadings, all on the visual, factor were unexpected. Based on Lowenfeld's statements, it was expected that test 19 and 20 would have a high loading on the kinesthetic factor and would represent this factor since these tests were thought by Lowenfeld to measure hapticity (qua kinesthesis).

The variables that represented the kinesthetic factor were as expected, tests 17 and 18, the Physiognomic Cue Tests.

Utilizing a factor analysis program of Statistical Package for the Social Science (SPSS), a determination was made as to the sex differences between the visual, kinesthetic, and cognitive modes of information handling of the

TABLE 2
Summary of Sex Differences Based on Mean Scores and Standard Deviations

		Mean-Standard Deviations				
		Male (n = 52)		Female (N = 51)		
		S.D.	Mean	S.D.	Mean	
1	Age	6.4	167.0	6.4	165.8	nd
2	I.Q.	14.4	100.6	14.1	104.0	nd
3	Hidden Fig.	1.8	3.3	1.4	3.2	nd
4	Hidden Pat.	23.6	80.7	24.5	85.4	nd
5	Gestalt Compl.	1.9	6.9	1.7	6.4	nd
6	Concealed Words	3.5	11.8	2.3	11.7	nd
7	Obj. No.	3.3	6.5	2.8	6.5	nd
8	First-Last Name	3.7	6.8	3.2	9.3	d
9	No. Compar.	6.0	20.2	4.6	24.4	d
10	Id. Pict.	7.5	31.6	8.1	31.9	nd
11	Maze	3.2	9.0	2.8	8.5	nd
12	Maze	3.0	11.9	3.9	11.1	nd
13	Vocab.	3.3	6.5	3.9	7.8	nd
14	Vocab.	3.5	6.3	3.3	6.8	nd
15	Subt.-Multi.	8.9	17.5	5.7	19.1	d
16	Subt.-Multi.	9.1	17.9	5.9	19.4	d
17	PCT	8.0	60.0	11.5	60.4	nd
18	PCT	9.0	60.3	12.0	56.1	nd
19	Match. Pr.	12.1	36.3	13.3	35.4	nd
20	Tactile	40.8	103.5	46.6	115.0	d
21	Vis.-Kin.	23.7	69.2	28.2	68.3	nd
22	Succ.-Imp.	31.9	48.5	13.7	42.6	d
23	Gerund	7.06	12.1	5.36	12.3	nd

Level of significance based on $< .05$

d = difference

nd = no difference

total number of Ss; the results are shown in Table 3, Summary of Sex Differences Based on Mean Scores and Standard Deviations.

A targeted rotation, according to Thurstone's (1947) simple structure criteria was conducted based on the theoretical selection matrix of this present study. The factor intercorrelations are indicated in Table 3, Matrix of Factor Intercorrelations.

TABLE 3

Matrix of Factor Intercorrelations

Factors	A	B	C
A	1.00	−.027	.17
B		1.00	.14
C			1.00

Discussion

In this study, three psychological meaningful factors accounted for all the common variance among the scores. Factor loadings based on an arbitrary cut-off point of .30 or more on each of the three rotated factors A, B, and C were interpreted.

TABLE 4

Factor A: Cognitive Factor

Variable Number	Title	Loadings	h²
1	Age	−.48	.25
2	I.Q. (Kuhlmann-Anderson)	.74	.59
4	Hidden Pattern	.38	.24
8	First-Last Name	.68	.60
9	Number Comparison	.35	.48
13	Vocabulary Test 1	.49	.44
14	Vocabulary Test 2	.39	.31
15	Subtraction & Multiplication 1	.65	.48
16	Subtraction & Multiplication 2	.59	.46

The Hidden Figure Test had a high difficulty level according to French (1963); apparently subjects in this study were confused by this test, this may be offered as an explanation for the low loading of this variable on the cognitive factor.

It became apparent merely by observation of the factor loadings that every variable had some loading on all three factors. Indeed, variables that were considered to be predominantly cognitive had some of the highest loadings on the visual factor, i.e., the Maze Tests. Such a condition is termed cross-over or complexity. Complexity is a condition in which a test is saturated with more than one factor, i.e., the test is measuring some other ability than it is presumed to measure. This means that a test may be biased by other abilities that may be latent in the test.

The reliabilities utilized in this study were based on the corresponding communalities of each variable. This is an acceptable rationale since the reliability of a variable is always larger than its communality.

TABLE 5

Factor B: Visual Factor

Variable Number	Title	Loadings	h²
11	Maze Tracing, part 1	.69	.58
12	Maze Tracing, part 2	.78	.65
19	Matching Pairs of Figures	.53	.42
20	Tactile	.30	.23
21	V-K Experience	.48	.36
22	Successive Impression	.34	.27

Factor B was interpreted as requiring an ability to structure imagery in some form.

The conclusion reached is that the tests Lowenfeld devised to measure the visual-kinesthetic-indefinite mode of perception did not perform this function in toto. The high loadings on Factor B indicate that the tests Lowenfeld devised to measure the visual mode did indeed do this; however, the tests Lowenfeld devised to measure the kin-

esthetic mode, actually measured either the same or different facets of the abilities that are included under the visual factor, yet all falling within the range of visual ability since they all had positive loadings, except, the Gerund Test, on the Visual Factor.

The Tactile Test, V-K Test and S-I Test all required that subjects view an image. This was required whether subjects actually viewed an image or had none presented to them as in the case of variable 19, Matching Pairs of Figures, which was a tactile test. It still did not prevent the loadings from clustering under the visual factor. In the Matching-Pairs Test, it appeared a *priori* that this test might be a relatively pure factor, i.e., kinesthetic. In this study it is not.

The conclusion was reached that the visual factor encompasses unifying an incomplete image as well as spatially scanning an image that is visibly present. If an image is not present, then subjects resorted to the utilization of the imagery.

Even under a separate study of factor analysis, Lowenfeld's tests, Matching Pairs, Tactile, V-K, and S-I Tests, all loaded high on the visual factor; they clustered together on the same visual factor even when different numbers of factors were extracted to break them apart. Therefore, Lowenfeld's haptic tests were concluded to be measuring visual abilities even when the visual stimulus is not present.

Since the PCT tests measure affective abilities, it would seem logical to conclude that Factor C also is involved in the subjectivity of subjects responses. The PCT indicated no significant difference between scores of male and female subjects in this study. Rosett and Robin (1964) did find a difference between adult male and female subjects in their study of the PCT. Wallach and Kogan (1965), however, in fact did not find a difference between the sexes when young children were subjects. This portion of the PCT needs replication on various age levels since it appears that sex differences relative to the PCT depend on the age level of the subjects. It may be that above age 11 to 13 years, as in this study, there is a sex difference, as indicated in the Rosett and Robin study of adult subjects.

TABLE 6

Factor C: Kinesthetic Factor

Variable Number	Title	Loadings	h²
8	P-2	.39	.48
10	P-3	.32	.30
17	PCT, part 1	−.76	.59
18	PCT, part 2	−.76	.59

Conclusions

As a result of this study, the following conclusions were made:

1. A minimum of three common factors accounted for all the observed relationships among the 23 variables.

2. Three factors were designated as Cognitive, Visual, and Kinesthetic; they comprised domains by which subjects handled information present in the art environment.

3. The contribution each factor made to the total communality on rotation were as follows:

a. The common factor variance of the Cognitive ability was 53.8% of the total variance. This factor is substituted for Lowenfeld's indefinite mode of perception which is too ambiguous.

b. The visual ability had a contribution of the total communality of 26.0%; this is compatible to Lowenfeld's visual mode of perception.

c. The kinesthetic ability had a common variance of 20.2%; this is compatible to Lowenfeld's haptic mode of perception.

4. It is concluded that Lowenfeld was partially justified in stating that

the modes of perception included the visual and haptic (qua kinesthetic) modes; this study concluded that there are visual, and haptic modes of perception, but also that another mode should be included and that is the cognitive mode. However, Lowenfeld's tests did not measure the haptic mode, they measured instead the visual mode of perception. This is understandable, since Lowenfeld's tests had low reliability and low validity (Wiggins, 1951).

5. Based on Table 3, Matrix of Factor Intercorrelations, it can be seen that the three factors show low intercorrelations which are rather distinct; the conclusion was made that the factors are orthogonal, or very nearly so. This means that knowing a person's score on one test that loaded on one factor would be of little help in predicting the performance on another factor. A sufficiently optimal fit of the hypothesized factors of Visual, Cognitive, and Kinesthetic was achieved based on a targeted rotation.

Recommendation

This factor analysis should be replicated. Further studies should be conducted via factor analysis utilizing other tests that purport to measure modes of perception related to an art context. Also such studies should be conducted on varying grade levels in order to fully describe the abilities that are involved in various age levels of art.

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Appendix

Matching Pairs of Figures, Test 19
This test was administered similar to that described by Lowenfeld (1945) but with some innovations. Scoring was based on the number of correctly paired figures divided by the time in seconds necessary to complete the test. The geometric figures are shown in the Appendix.

Example: 10 correct matches done in 75 seconds —

$$\frac{10}{75} = .133$$

A score of 133 (the decimal point was dropped) was indicative of a high score of kinesthesis (hapticity). This was the method of scoring for all four of Lowenfeld's tests. Lowenfeld stated this test measured the haptic-indefinite mode.

Test of Tactile Impression, Test 20
This test was performed according to Lowenfeld's description (1945). The same geometric figures used in the previous test were used to measure tactile mode.

Visualization of Kinesthetic Experience, Test 21
Instructions were similar to those described by Lowenfeld (1945). A sample of the figures is shown in the Appendix (used to measure the visual mode).

Test of Integration of Successive Impression, Test 22
Instructions were compatible to those given by Lowenfeld (1945). A sample of the figures is shown in the Appendix (used to measure the visual mode).

Gerund, Test 23
This test was administered according to Lowenfeld's description (1945). A value of three points was allotted to each visual response; two points for each indefinite response, and one point for each kinesthetic response. A total score was obtained by summing these scores (it was purported to measure the visual, haptic or indefinite mode).

All cognitive tests were administered and scored as paper and pencil tests; one point was given for a correct response, then the total number of correct responses was summed (French, 1963).

Physiognomic Cue Test, 17 and 18
This test allowed subjects to respond to one of six multiple choices per item. The first choice was given a weight of six; the last choice was given a weight of one. In between selections were also recorded and scored. A grand total score was obtained by summing all the weights (it was purported to measure the affective or kinesthetic mode).

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THE PERCEPTION OF ENVIRONMENTAL FORM

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When we approach a painting in a gallery, the environmental conditions for our direct-sense perception are not significantly different from when we confront a room in a building. There are specific viewing positions involved in each of the two transactions, and the perception of sensory form in both cases results in concrete experience. In the case of the room, we do not ordinarily think twice about the specific viewing position. Of course, if it is not possible to see the painting, it is necessary to think about a specific viewing position for seeing the painting.

The fact that there may be a specific viewing position *intended* by the artist for the perceiver of the painting could make another difference. Knowing "where" the artist had in mind for the perceiver to stand could prove to be critical information, and whether the artist did in fact have a "where" in mind for the viewer would then have to come first in the steps leading to the concrete experience of the painting. This, however, may be carrying things too far.

Direct-sense perception is the usual basis for our response to sensory form at the scale of the room and the painting-perceiver transaction. Indirect symbolic perception also plays a part in our response to form, but ordinarily we include symbolic perception in our impressions at the scale of the room only when the room itself contains significant symbolic content, such as a painting. The possibility is always present, however, to include both direct-sense perception and indirect symbolic perception at the micro-scale of the room and the building.

This is *not* the case at the macroscale of the city and the region. When we attempt to confront the sensory form of a city or a region, the environmental conditions for our direct-sense perception are significantly different than when we confront a painting in a gallery or a room in a building. The following story will illustrate this point clearly — and serve as a preface to a case-study in the perception of environmental form.

Concrete and Abstract Experience

When Helen Keller learned the sign language word for "water" in the morning while she was washing her face and again learned the word for "water" in the afternoon while she was drinking from a mug, the idea of abstraction and the function of words finally got across to her. Although she was blind and a deaf-mute, her learning picked up rapidly after the day she caught on to the power of abstract symbols (words).

Now, in terms of the perception of environmental form, how could Helen Keller acquire "the sense of a region"? Certainly not in the same direct way she acquired the sense of water by personal touch. Somewhere between washing and drinking, on the one hand, and the sense of a region, on the other, we must go from direct-sense perception (the individual level of concrete experience and language development) to symbolic perception (the socio-

cultural level of abstract experience and language development). Stating the question in another way makes the point more manageable: At what scale would Helen Keller no longer learn about her environment directly through her senses and have to depend on putting abstract symbols (words) together to generate abstract experience without the aid of concrete experience?

The *symbolic system*[1] invariably must be used to synthesize and analyze large-scale environmental form. A good question for visual art educators, who eventually will want to understand the context in which paintings and buildings are made and viewed as well as the paintings and buildings themselves, comes from the story of Helen Keller. Where does that point of changeover occur in the environmental design process between perception based upon direct sensory form (concrete experience) and perception based upon symbols (abstract experience)? The answer is, of course, when thinking and feeling go from the micro-scale of the room and building to the macro-scale of the city and region.

The Image of the City

Readers of this journal likely are familiar with the book published in 1960 entitled *The Image of the City.*[2] Now, 15 years later, Kevin Lynch has written another book that breaks new ground in environmental design. Lynch's latest work focuses our attention on phenomena different from the earlier work. This time, according to Lynch, the sensory form of the region rather than the image of the city is the key factor in the task of environmental design and management.

Of course, the sensory form of a region cannot be perceived readily, and few persons can say they ever received any formal training in the perception of environmental form at the scale of the region. In actuality, the perception of

regional form would require the stitching together of numerous and diverse images, systematically acquired and remembered over considerable spans of time and extensive areas of geography. Perhaps those few persons trained in the discipline of geography can do it, but regional form is not directly familiar to most of us. We do not know the environmental form of the region on the basis of concrete experience.

On the other hand, the image of the local community can be assembled by some people who can describe a familiar picture in their *perceptive experience*.[3] Even though much attention has been paid to environmental problems such as pollution and congestion in recent years, the perceptive experience of those problems for most of us has been a fairly intimate and personal affair. Evidently, for most people the upper limit in the perception of sensory form is at the intermediate scale of the town center and the neighborhood.

Back in 1960, *The Image of the City* showed town centers were within the scope of direct sensory form perception and concrete experience. Varied individuals generated images that were fairly accurate and detailed in terms of the center of town, and although the professional image of the local scene turned out to be somewhat different than the public image, the difference was mostly a matter of emphasis.[4] At the scale of the region, however, abstract symbols (words) predominate and control the process of perception — and only abstract symbols (vocabulary and language in the usual sense), without the aid of direct sensory form perception, account for the knowledge we have about regional form.

The Symbol of the Region

For example, take the question of public policy and its formation. There has always been a public policy (stated and

communicated in just so many words) at the scale of the nation in the United States, and also at the scale of the state or region — but not at the scale of the local community. It just seems there has been a public policy (stated in so many words) at the local level because we all seem to have the same concrete experience at that level. By the time rules (policy) that govern the promotion and control of environmental form reflect the values and opinions of the public-at-large, however, the macroscale of the region has imposed its inherent symbolic limitation on directsense perception and concrete experience. Only abstract symbols (words) and abstract signs (marks and gestures to replace words, such as: maps and diagrams) can intelligently handle the messages and forms involved in environmental design at the regional scale. Exactly where environmental "policy" becomes public between the micro- and macro-scales is another good question for visual art educators.

At one point in his new work entitled *Managing the Sense of a Region,*[5] Lynch states that the sensory form of the region is "too personal" to be included in public discussions. This jibes with what has been said above. Lynch's new book itself, in this sense, may be "too personal" to be able to tell the public how to go about managing the sense of a region. At another point Lynch says: "A unified language appropriate to the sensory form of regions will be a long time developing, if indeed a unified language is possible."[6] This insight deserves further consideration because it is so much like a statement made by Lynch at the conclusion of his earlier work on the image of the city. If by a unified language Lynch means concrete experience and language development based upon our own and Helen Keller's direct-sense perception, then the statement is true enough. Perhaps, however, we are "barking up the wrong tree" to try to get at a language of con-crete sensory form in macro-environmental design. Perhaps what we should be after is a precise and clear-cut language of abstract symbolic form.

With or without a unified language of sensory form, Lynch's new book is an important essay because it deals with more than one scale of environmental perception. Several appendices, similar in this respect to his *The Image of the City,* suggest timely techniques for visual art educators. Appendix 1, entitled "Work to Date," and Appendix 2, called "A Glossary of Techniques," are especially useful. For instance, Appendix 2 illustrates how we can synthesize as well as analyze environmental form in terms of images, sequences, visibility, and spatial behavior.

Paying professional attention to the macro-scale of environmental perception is a relatively new idea. *Managing the Sense of a Region* should be a welcome addition to the growing body of literature on the perception of environmental form in the study of ethnographic and human settlement patterns. It should also be a welcome text in visual arts education where the need now to learn and teach the skills of environmental perception is no less significant.

Case Study at the Macro-Scale

An abstract pattern can be an example or a paradigm if it is an outstandingly clear or typical example. When a set of patterns describes the working relationships between the processes within some problem area, it defines what is to be studied, and we call it a "model." And, when a model simply represents a special focus or emphasis within the larger composition of processes, we call it a "mini-model," or simply a case study.[7]

The following mini-model comes from a larger study which emphasized the perception of abstract patterns of human settlements and communities at

the macro-scale of environmental form. Since 1930 the Ijsselmeerpolders in the Netherlands have been reclaimed from the former Zuider Zee,[8] and the community pattern in each of the Ijsselmeerpolders is on the order of a region rather than a city, town, or village.[9] Larger than the typical township in the midwestern part of the United States, the Ijsselmeerpolder community contains farms and villages and towns and city regions within its corporate boundaries. It is the smallest unit of governance in the Netherlands, but its environmental form is large in area, both rural and urban in character, and contiguous geographically with surrounding communities.

First and foremost, the Ijsselmeerpolders *gemeente* (community) owes its unique environmental form to the basic tenets of Dutch democracy, and the foremost tenet of Dutch democracy is *orderliness*.[10] This contrasts with the basic tenet of American democracy, namely, individual freedom. There are no left-over areas between the corporate limits of these Dutch communities, and in the interest of orderliness the Dutch government has built the entire visual and physical environment of farms, villages, towns, and city regions in the Ijsselmeerpolders area. The Dutch government also maintains leases on almost all of the land, and environmental form makes its contribution to successful community development on this context.

Visual designs expressed as abstract patterns of spatial organization that further express the personality and philosophy of life of both the community and its culture remain living patterns long enough for case-study analysis, and an orderly set of such abstract patterns can occupy a higher level of understanding than just a little descriptive study of the Dutch landscape. What follows seeks to express quickly not the appearance of Dutch communities, but their underlying environmental form

or structure from the standpoint of abstract symbols (words) and abstract signs or patterns (maps and diagrams). Thus, visual design in the Dutch Ijsselmeerpolders is the explicit intention to make abstract symbols and signs or patterns of farms, villages, towns, and city regions within the overall area encompassed by the old Zuider Zee.

Figure 1 shows the map for the draining of the Ijsselmeerpolders. It also shows the 18-mile long barrier dam which separates the salt-water North Sea from the new fresh-water Lake Ijssel and which connects the northern and southern parts of the Netherlands at its western edge. The first visual design in 1930 for the first polder, the Wieringermeer, was an abstract pattern of small farms and three villages as shown in Figure 2. The three-village pattern was built during the following decade, and, then, an additional or fourth village became the basis in 1940 for the second visual design, as the apparent need arose to provide more convenient access to a village from some of the small farms in the eastern part of the Wieringermeer.

Figure 1 (again) shows the North-East polder was drained in 1942, and Figure 2 (again) shows the third visual design was created in 1943 by the Ijsselmeerpolders Development Authority. It followed the basic abstract pattern of the Wieringermeer. The North-East polder, however, required a focus for its larger area, and in 1948 the third visual design (expressed as an abstract sign or pattern in Figure 2) showed a distinctive geometry of small farms with a centrally-located village surrounded by five villages. In the fourth visual design a few years later, in 1948, the five-village pattern gave way to a pattern of 10 villages surrounding a centrally-located new market town.

Figure 1 (again) shows the draining of the third polder, Eastern Flevoland, occurred in 1957. As shown in Figure 2

Figure 1

North Sea

Barrier Dam

UNITS OF ANALYSIS

- • Village
- ⦿ Town
- ◎ City Region

WIERINGERMEER
1930

Lake Ijssel

NORTH-EAST POLDER
1942

MARKERWAARD
1980

EASTERN FLEVOLAND
1957

Amsterdam
◎

SOUTHERN FLEVOLAND
1968

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Figure 2
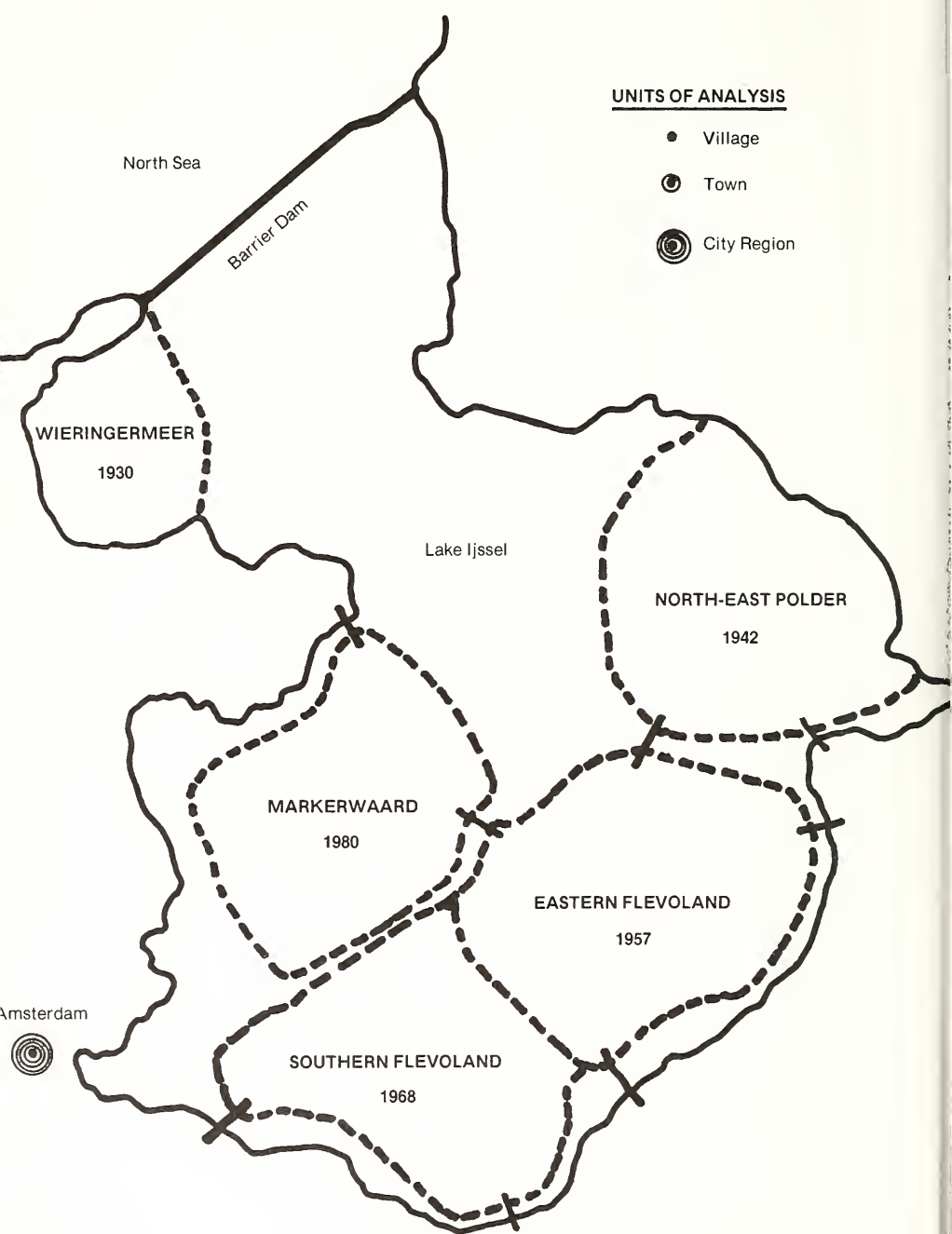
WIERINGERMEER

1930

1940

NORTH-EAST POLDER

1943

1948

EASTERN FLEVOLAND

1954

1958

1959

1965

SOUTHERN FLEVOLAND

1968

1972

(again) as early as 1954 the fifth visual design expressed as an abstract pattern specified large farms and 10 villages related loose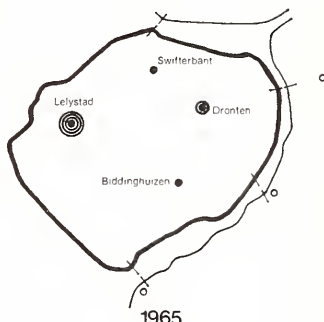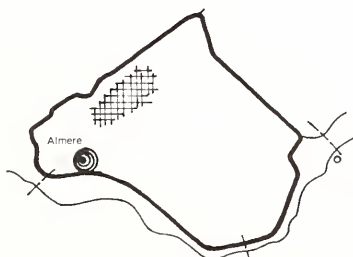ly to both a new market town and a small city region. By 1958 the number of villages was decreased to six, and in 1959 to four. Finally, in 1965, eight years after the draining of Eastern Flevoland, the eighth visual design was formulated, and Eastern Flevoland became two distinctive communities: large farms and a market town with two villages expressed a rural and agrarian goal, and the small city region of Lelystad expressed an urban and industrial goal or *bestemming*.[11]

When Southern Flevoland, the fourth polder, was drained in 1968, as shown in Figure 1, the problem of dealing with the population growth of the Randstad, and especially of Amsterdam, became the highest priority for consideration by the Development Authority. The ninth visual design, as shown in Figure 2, therefore, reflected in 1968 only an industrial goal in the form of the small city region of Almere. At this time another visual design opportunity presented itself to the Development Authority: the need for recreational facilities on a large scale for the growing population of the Randstad. Beaches, recreational waterways, nature preserves, and other leisure-time amenities added up to the need for the new recreational town of Zeewolde in the north-eastern part of Southern Flevoland, as shown in Figure 2. Thus, Southern Flevoland as seen in the tenth visual design in 1972 will also become two distinctive communities: the small city region of Almere will express an urban and industrial goal and the new town of Zeewolde with surrounding farms will express a combined recreational and agrarian purpose.[12]

Success

What has the above series of ten visual designs expressed as abstact patterns for environmental form contributed to the success of human settlement and community development in that part of the Netherlands called the Ijsselmeerpolders? It became apparent through the visual design and development of the first polder, the Wieringermeer, that the social study of human life had to be tied tightly to environmental design, and in particular to the abstract signs or patterns for regional community form. Among the early studies for the North-East polder, an inquiry was made to determine the acceptable distance between farm and village as viewed by the residents themselves. At that time and for that place, the results of the study revealed the residents considered a distance of three miles or five kilometers most acceptable. The abstract pattern of 10 villages, rather than five villages, surrounding the centrally-located market town of Emmeloord had followed from this requirement in the final visual design for the North-East polder.

Today, some 30 years later, the North-East polder is a very convenient and prosperous community. Among other things, over 500 clubs thrive in the town of Emmeloord which only has a population of 10,000 people. The residents of the North-East polder enjoy their traditional community with its high degree of suitability for their agrarian-oriented life-style — and environmental form, according to interviews with residents, accounts for the large number of clubs and the high level of satisfaction in the North-East polder with its small size of all farms, large number of villages (10), short distances between farms and villages, and extremely easy access to the town of Emmeloord.

On the other hand, the sequence of changes that took place in the four chronologically-ordered visual designs for Eastern Flevoland was based upon the impact of new technology on agri-

culture, transportation, and the development of industry in the Netherlands immediately after World War II. Thus, by 1965, as was shown in Figure 2, the availability and use of the automobile and the motor-bike as well as other auto-machinery developments in both agriculture and industry required only two villages out of the original set of 14.

Today, over a decade later, the final visual design for Eastern Flevoland with its abstract pattern of large size of all farms, small number of villages (two), easy auto-transport between farms and villages, and easy access to the market town of Dronten, as was shown in Figure 2, accounts for the high level of satisfaction which residents feel about their quite modern, but still basically agrarian-oriented community. The large farms in Eastern Flevoland function effectively with their two villages: Swifterbant and Biddenhuisen, and the residents of the Dronten community get together regularly at de Meerpaal, the modern community center in Dronten, for varied kinds of community affairs, such at the Mardi-Gras festival, theatrical events, and sports contests.

Resident satisfaction also runs high in the industrial-oriented community of the small city region of Lelystad based on the final visual design for Eastern Flevoland, as was shown in Figure 2. This small city region has grown thus far to about 30,000 people and is well-liked by its relatively young and pioneer-type residents, some of whom commute to jobs in the Randstad and Amsterdam. Thus, it would appear that the total abstract pattern of Eastern Flevoland, along both rural-agrarian and urban-industrial lines, was handled with success because the Ijsselmeerpolders Development Authority did not have to contend with both a rural goal and an urban goal at the same time for the same regional community.

Environmental form contributed to successful community development in the Dutch Ijsselmeerpolders because its abstract patterns were the result of research as well as progressive legislation.[13] When the 10 visual designs are looked at in the light of the overall development process from its beginnings in 1930 to the present time, their major effects are clear-cut: (a) making and keeping all the farms small and providing a larger number of villages in the Wieringermeer, and again in the North-East polder, assured a successful rural and agrarian life-style, (b) later on, making and keeping all the farms large and providing a smaller number of villages in Eastern Flevoland allowed for modernization without urbanization, (c) at the same time, articulating the abstract pattern of the small city region of Lelystad in Eastern Flevoland, and again the small city region of Almere in Southern Flevoland, provided a successful urban life-style by allowing the Development Authority to concentrate mainly upon industrial development without conflict and interference from abstract patterns of agrarian development.

The environmental form hierarchy of farms and villages and towns and city regions is working according to the residents of the Ijsselmeerpolders communities. The intelligently conceived and conducted orderliness of the Development Authority through its visual designs expressed as abstract patterns in the long-range regional community design process may be considered responsible for the successful outcome. Community development continues to work in the Dutch Ijsselmeerpolders because the special focus and emphasis placed upon environmental form at the macro-scale of the region is an integral and important part of public-policy and decision-making in the Netherlands — and because "the perception of environmental form" continues to be based upon visual designs expressed as abstract patterns backed up by action-research with periodic evaluation and feedback.

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3. Whitehead, A. N. *Symbolism: Its Meaning and Effect.* New York: The Macmillan Company, 1959, 17.
4. Lynch, pp. 148-149.
5. Lynch, K. *Managing the Sense of a Region.* Cambridge, Mass.: The MIT Press, 1976.
6. Lynch, ibid., p. 120.
7. Spindler, L. S. *Culture Change and Modernization: Mini-Models and Case Studies.* New York: Holt, Rinehart and Winston, 1977, p. 9.
8. The land reclaimed from the Zuider Zee is *re*-claimed land. The area was inhabited as late as the beginning of the tenth century, A.D. Through flooding and diking, the area became the Zuider Zee by the middle of the twelfth century, A.D. See: Gerald L. Burke. *The Making of Dutch Towns: A Study of Urban Development from the Tenth to the Seventeenth Centuries.* London: Cleaver-Hume Press, Ltd., 1956.
9. The author made numerous visits to the Ijsselmeerpolders and conducted interviews with residents of the Ijsselmeerpolders communities as well as with members of the Dutch government and other individuals while a Fulbright scholar in the Netherlands from January to June, 1976. A detailed log of each visit was kept along with the gathering of official reports and historical documents.
10. Goudsblom, Johan. *Dutch Society.* New York: Random House, 1967.
11. The city regions of Lelystad (projected population of 100,000 people) and Almere (projected population of 200,000 people) were planned to relieve the Randstad, which is a high-density concentration of people distributed in the form of an urbanized horseshoe. The Randstad includes the city regions of Amsterdam, the Hague, Rotterdam, Leiden, Haarlem, and Utrecht. See: Gerald L. Burke. *Greenheart Metropolis: Planning the Western Netherlands.* New York: Macmillan and Company Limited, 1966.
12. The diking of the fifth polder, the Markerwaard, is in progress, as shown in Figure 1. The other four polders are operational, although a considerable amount of new construction activity is evident in Southern Flevoland inasmuch as it was just drained in 1968.
13. The *Third Report on Physical Planning in the Netherlands* will be published in 1978 and will deal with questions of rural development to a greater extent than did the *Second Report* which was published in 1966 and dealt, in large measure, with urban affairs. The *First Report on Physical Planning,* published in 1960, came at a time when the Dutch government was on the threshold of generating new legislation on housing and physical planning, namely, the *Physical Planning Act of 1962* and the *Housing Act of 1962.*

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Introduction

The aesthetic preferences of children have been studied by many teachers and research workers (Aitken and Hutt, 1974). A related topic, of importance for the stimulation of art appreciation and the wider use of works of art in schools, is whether teachers can understand and allow for students' aesthetic preferences. To what extent can teachers accurately estimate the preferences of students at both primary and secondary levels? To what extent would teachers' selections of pictures for schools be concordant with students' preferences?

These questions were examined for primary and secondary school teachers and pupils separately. It was thought that secondary school teachers might be able to assess secondary students' preferences accurately if the students liked the same kind of pictures as the teachers. On the other hand, younger children might show more obvious stereotyping in their likes and dislikes, and if so the teachers' task of understanding these preferences would be easier.

A convenient review of recent research in art education has been provided by Hardiman and Zernich (1970-74). However, there has been little investigation of the particular questions we have described. There has been one related study concerned with television programs (Becker and Wolfe, 1960). Teachers can predict quite well the interest shown by 11 and 12-year-old children in segments of a scientific film, but they are rather poor at predicting the interest of 4 and 5-year-olds watching programs concerning nursery school activities. This might suggest that secondary students' aesthetic preferences would be easier to predict than those of primary students, although works of art and television programs are somewhat dissimilar stimuli.

In the present studies, we were particularly interested in the teacher's task of selecting art works for schools, for special study and for general display. Exhibitions of suitable works may be arranged for teachers to examine and to select items for purchase on behalf of a school (Scrapel, 1972). General principles providing guidelines for such selections have been suggested by Gropper (1973). Among the guidelines is the advice: ''In selecting art works for the classroom the teacher should realize that they should appeal to the student on the sensual, emotional and intellectual levels'' and be ''in accordance with where the students are in their aesthetic development.''

Clearly teachers can most readily act in accordance with this advice if they have some knowledge of the preferences held by the age group of children for whom they are selecting. This is not to imply that only popular pictures should be chosen; rather, the judged preferences of students at the appropriate level should be one factor influencing choice. Teachers, then, should have a clear idea of children's preferences. We mean, of course, children as a group; we are not concerned here with the teacher's ability to predict an individual child's idiosyncratic preferences.

Empirical Studies

It is important in studying teachers' understanding of children's preferences that the works of art used should be of aesthetic merit, suitable for hanging in schools, and exemplifying a wide variety of types. A special exhibition of 76 framed pictures displayed in a large room of a public gallery was used. All pictures had been selected as suitable for hanging in schools, and consisted of the following selections: 13 original oil paintings and 6 paintings in other materials by contemporary artists of repute; 21 original prints; 8 good reproductions of 15th to 18th century oils and 10 good reproductions of 19th and 20th century oils (from Giovanni Bellini to Picasso); 11 selected paintings by art students, and 7 pictorial textiles by contemporary designers.

The pictures were also classified with reasonable reliability with regard to the following overlapping types: those which had a familiar subject matter for children (60 of the items were of this type); those which were representational rather than abstract in style (54 items); simple rather than complex in design (47 items); brightly colored, with primary colors of high saturation (43 items). Thus the children's preferences and the teachers' selections could be related to each of these various types of picture, as well as to individual items.

Four groups of students who visited the exhibition cooperated in a study of their reactions to the pictures. At the primary school level, there were 75 students in two age groups. They included 20 7-year-old and 14 11-year-old boys, and 21 7-year-old and 20 11-year-old girls. At the secondary school level, there were 49 students aged 15 years, 28 boys and 21 girls. Each child was asked, "Which picture do you like best?" and "Which picture do you like next best?" The children had previously been escorted around the entire exhibition, and while deciding their first preferences they were allowed as much time as they wished to look around the exhibition again. Each primary school child was questioned by one of eight trained interviewers; each secondary school child completed a written questionnaire.

Teachers viewed the exhibition and completed questionnaires individually. In total, 30 primary school teachers and 17 secondary school teachers completed the following task (*inter alia*): "Imagine that you are free to choose some pictures for a school and that there is no limitation of money or of suitable hanging-space. List the first four pictures you would choose, in order of preference . . . Against each choice, state why you have chosen it." There were 44 pictures selected at least once by the primary teachers, and 35 pictures selected at least once by the secondary teachers.

To what extent did students like the pictures which were selected by teachers as suitable for hanging in school? Before answering this question, we may note that there are two distinct ways in which teachers' judgments and students' preferences may be associated. First, teachers may be able to judge correctly the individual pictures liked by students. Second, teachers may not be successful in judging the particular works, but may be successful in allowing for the types of art liked by students. These two aspects of judgment may be relatively independent: a teacher might recognize that the particular subject matter of a picture would appeal to students, but not recognize the generally popular types of art; and conversely, a teacher might allow for popular types without being able to identify those individual pictures which best represent those types in the students' preferences. Both of these aspects of association are considered.

To measure the degree of association between teachers' choices and students' preferences we used the index λ (Goodman and Kruskal, 1954). Rather

like a correlation coefficient, the index may have a value as low as 0 (representing no relationship), or as high as 1 (representing complete agreement), or any value in between. The calculation of λ allows for the number of pictures involved, the number of selections made, and the extent of agreement between students and teachers which might arise merely by chance coincidence.

The obtained degree of association, between the students' preferences and the teachers' choices of pictures suitable for hanging in schools, was moderately high for both primary and secondary students. The values were .59 and .54 respectively, and were significant, using the students' first preferences. Similar values were obtained when the students' second preferences were analyzed. The teachers were therefore moderately successful in choosing appropriate pictures which appealed to students, at both primary and secondary levels.

To what extent were the teachers' selections associated with students' preferences for certain *types* of picture? Before answering this question, the types of picture which were popular with the children must be defined. The primary school children showed significant preferences for five types of picture: those in a representational style; those with subjects familiar to children; brightly colored; oil paintings (original or reproductions); and those simple in design. The strongest influences on the children's preferences were representational style ($\lambda = .86$) and familiar subject matter ($\lambda = .62$).

The primary teachers' choices for schools significantly reflected these popular types of picture. The teachers tended to select brightly colored items ($\lambda = .60$), those with familiar subjects ($\lambda = .59$), representational pictures ($\lambda = .49$), and oil paintings ($\lambda = .25$).

Quite different results were obtained in the case of secondary school teachers. The secondary students, like primary students, significantly preferred representational pictures ($\lambda = .78$), oils ($\lambda = .37$) and brightly colored items ($\lambda = .33$). However, the secondary teachers' selections for schools did not reflect these popular types at all. The relevant association values were all zero or near zero. For example, secondary students showed a clear preference for representational pictures, but this was not reflected in the teachers' selections. Indeed, students' preferences and teachers' selections differed significantly in this respect.

Since secondary teachers nevertheless tended to select the individual pictures liked by students, it seems that their choices were made in terms of the particular content or characteristics of pictures rather than their general type. The secondary teachers, in contrast to the primary teachers, chose a wider variety of types of art, to broaden their students' aesthetic experience.

These findings may be illustrated by details of the teachers' selections. The three pictures most often chosen as suitable for hanging in primary schools were each brightly-colored oils of familiar subject matter painted in a representational style: Christopherson's oil painting "The Clown," a good quality reproduction of Renoir's "On the Terrace" and Breughel's "Children's Games." On the other hand, secondary teachers chose a more varied selection of interesting works, such as Terry McGlyn's abstract in gouache and ink called "Tuscan Street," and a representational rubbing from a Chinese temple of "Two Black Horses." Such items were of undoubted aesthetic interest, but they did not reflect the types of picture which were popular with the secondary students. As a group, the secondary teachers chose a wide range of different types as suitable to hang in schools, including prints and textiles. Indeed the choices of the secondary school teachers for the seven different categories of exhibit were

approximately in proportion to the number of items in each category.

In a second study, teachers were asked to judge which painting in the exhibition most of the children would like best or next to best. Nine primary teachers and nine secondary teachers made these judgments. Eleven pictures were nominated at least once by the primary teachers, and 15 by the secondary teachers. The results were again different at primary and secondary levels.

At primary level, the degree of association between these nominations and primary students' actual preferences for particular pictures was very low. The λ values were .03 for students' first preferences and .19 for their second preferences. On the other hand, the primary teachers' nominations were clearly in tune with the *types* of picture liked by children. The association between primary teachers' judgments and children's preference for representational pictures gave $\lambda = 1$; that is, all primary teachers correctly judged that primary children prefer representational pictures. Similarly, there was a high association with pictures having a familiar subject matter ($\lambda = .74$) and with brightly colored pictures ($\lambda = .49$).

It follows from these results that primary teachers were able to assess correctly the *types* of picture liked by primary children, even though they were largely unsuccessful in identifying the particular pictures which were preferred. When asked why children would like the nominated picture, most of the teachers referred to its subject matter. For instance one teacher explained that children would like a painting "because its subject matter lies within their own experience of living." This raises the difficult problem as to how far art should express the child's experience, or alternatively how far art should extend that experience.

At the secondary level, teachers were rather more successful in predicting students' preferences for particular pictures, with significant association values of .38 for students' first preferences and .29 for second preferences. Could this be merely because secondary teachers have similar preferences to their students, and so base their judgments on their own preferences? The results show that this is unlikely, in that all teachers except one chose a different picture for their prediction of children's preference from their own first preference. Moreover, the association between the teachers' preferences, considered as a group, and the students' preferences was very low, with $\lambda = .26$ for first preferences and $\lambda = 0$ for second preferences. To illustrate this point, Canaletto's "Quay at the Piazetta" was popular with secondary students; whilst the teachers showed no general consensus in their own preferences, but some selected an abstract, complex work such as John Piper's lithograph "Abstract."

Unlike the primary teachers, secondary teachers' predictions of students' preferences showed no significant recognition of the types of pictures liked by students. The association values between teachers' nominations and preferred types (brightly colored, representational oils) were low and not significant. It would seem that the secondary teachers assumed a more sophisticated spread of preferences among students than in fact occurred. The preferences of the 15-year-old students were like those of "conventional laymen" rather than those of art students seeking new inspiration.

Discussion of the Findings

The results presented above are complex but consistent. Apparently, both primary and secondary teachers were able to take students' preferences into account to a moderate degree when choosing pictures as suitable for hanging in schools; this was so both for

particular pictures and for popular types of art. Yet when attempting to predict students' preferences directly, they were not as successful. Possibly the teachers thought (incorrectly) that children might be interested in more complex abstract pictures in the quiet atmosphere of an art gallery; whilst they appropriately thought that more "conventional" popular paintings were suitable for hanging in the hurly-burly atmosphere of schools, particularly primary schools.

There were clear differences in the results for primary and secondary levels. To the extent that primary teachers were able to take students' preferences into account, this was predominantly in terms of the types of picture which were popular with primary school students. Secondary teachers, on the other hand, showed no evidence of taking the popular types of art into account, but to some extent they were able to allow for the popularity of particular pictorial contents. This difference partly reflected the fact that the secondary school students' preferences were rather less determined by "popular types" compared with primary students' preferences.

Although the association values were significant, their low levels when teachers were attempting to predict preferences for particular pictures demonstrated that teachers could improve their knowledge concerning students' aesthetic preferences. It is too easy to assume a greater level of interest and sophistication among students than they yet have. Teachers in secondary as well as primary schools should appreciate their students' strong preferences for brightly colored oil paintings in a representational style, when selecting pictures for schools.

Footnote

[1] The value of λ is calculated using the formula: $\lambda = (P - E)/(1 - E)$. P repre-sents the observed proportion of responses of the required kind, such as the proportion of preferences showing agreement with the teachers' selection. E represents the proportion to be expected by chance alone. For example, the value of E when comparing primary students' preferences with teachers' selections is .58 (*i.e.*, 44/76), because this is the proportion of pictures included in the primary teachers' selections. Those λ values given in the text which are statistically significant at the 5% level, using the Chi-square test, are italicized.

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THE EFFECTS OF PRIVACY AND NOISE ATTENUATION ALTERNATIVES ON THE ART-RELATED PROBLEM SOLVING PERFORMANCE OF THIRD- AND FOURTH-GRADE CHILDREN

Ronda Albright Moffit
Arizona State University, 1975

Abstract

The purpose of this study was to determine the effects of privacy and noise attenuation alternatives on the convergent and divergent visual problem solving performance of third- and fourth-grade children. In addition, it was intended to ascertain the extent to which the amount of privacy experienced in the home relates to the amount of privacy and noise attenuation needed in the elementary classroom.

A 2x2x2 factorial design with block-interaction confounding was used for the study, and the final sample included 186 subjects.

The treatments consisted of environmental privacy and noise attenuation options which the children were allowed to use whenever they desired during study and free times. The four groups which received the privacy option had four decorative privacy booths placed within their classrooms while the four groups which received the control level of the privacy condition had, instead, structural units visually identical to those out of which the privacy booths had been constructed placed within their classrooms in open arrangements that did not provide the opportunity for privacy. The four groups which received the experimental level of noise attenuation had the use of sound attenuating headsets which were placed within their classrooms, while those four sections receiving the control level of noise attenuation received placebo headsets.

The treatment duration consisted of 17 consecutive, full school days.

Measures obtained for criterion performance included five separate visual problem solving scores from two instruments. A form of *Raven's Progressive Matrices* provided a measure of convergent visual problem solving ability, and *Torrance Tests of Creative Thinking, Figural Form B,* provided four indices of divergent visual problem solving ability, i.e., fluency, flexibility, originality, and elaboration.

Other measures included a Home Privacy Questionnaire which was designed by the researcher to gather information about the subject's home privacy opportunity and preference, a simple ticket system which provided daily records of privacy and noise attenuation equipment usage, and the gathering of IQ scores from existing school records to provide covariate control in the event that groups had proved significantly different from one another in general ability.

Results included the following:

1. Children who were given the opportunity for privacy scored significantly higher on visual originality but significantly lower on convergent visual problem solving, visual fluency, visual flexibility, and visual elaboration than children who were not given the opportunity for privacy.

2. Children who were given the opportunity for noise attenuation scored significantly higher on visual flexibility but significantly lower on visual originality than children who were not given the opportunity for noise attenuation.

3. A significant negative correlation

was found between the extent of home privacy opportunity and the extent of usage of the opportunity for privacy in the classroom.

4. A significant positive correlation was found between home privacy opportunity and use of noise attenuating headsets in the classroom.

5. A significant positive correlation was found between home privacy opportunity and visual originality.

6. Great use was made of both the privacy booths and the headsets by third and fourth grade children.

Recommendations included suggestions that:

1. Modification of the physical classroom environment to provide privacy and sound attenuation should await further study of the opposite effects which these conditions have on flexibility and originality.

2. Future studies should extend the present investigation by examining the effects of privacy and noise attenuation on achievement variables, on general social climate and in a wider range of grade levels.

3. Investigations of the link between originality and social facilitation theories and the link between personal space concepts and the need for privacy should be undertaken.

REVIEW

Dennis W. White
University of Houston

Statement of the Problem

The title of this experimental investigation expresses the problem of the study in a clear and precise manner. Contained within the title's internal structure are the appropriate distinctions identifying the type of research undertaken, the independent and dependent variables considered, and the population attended to. This action, of constructing the title to reflect distinguishing elements encapsulating the investigative parameters, is laudable in that it avoided unwarranted obscurity often illustrated by dissertation titles.

Moffit's research attempted to ascertain the effect of privacy and noise attenuation alternatives on convergent and divergent visual problem solving performances of third- and fourth-grade children (p. 3). In line with this concern, the primary research questions asked were: (a) Will the convergent or divergent visual problem solving performance of third- and fourth-grade children offered alternatives for privacy during study and free times within the classroom differ from the problem solving performance of children not offered such alternatives? (b) Will the convergent and divergent visual problem solving performance of third- and fourth-grade children offered alternatives for noise attenuation during study and free times within the classroom differ from the problem solving performance of children not offered such alternatives? (c) Will the effects of noise attenuation and primary alternatives on visual problem solving performance be independent of one another, or will the effect of privacy depend upon whether the child is offered the opportunity for noise attenuation? (d) Will there be a relationship between the child's opportunity and preference for privacy in the home and the extent to which he elects to take advantage of the opportunity for privacy and noise attenuation within the classroom? The null form hypotheses were properly formulated in response to the questions posed.

The researcher presented an articulate and carefully constructed defense for proceeding with her investigative interests. Advancing the major premise that environmental variables directly influence creative problem solving performance Moffit supported, and

subsequently justified, the rigorous examination based on an assemblage of prior references, with respect to creativity, by Taylor and Barron, Guilford, and Torrance. She then proceeded to examine the role of spatial environment as expressed by Wohlwill, and the problem of personal seclusion as it may affect pedagogical spheres of interest advanced by the writings of Marshall, Chermayelf and Alexander, and Strom. It is evident that this interest pertaining to the purposeful management of an individual's life-space during the act of creation is both significant and central to comprehending those external factors having an effect on such endeavors. Davis (1977) supports this position with his observation:

> The learning environment must be manipulated, examined, and studied in order to determine how it assists or deters meaningful learning in the visual arts (p. 6).

The absence of empirical studies of an experimental nature within the art education field, with respect to this specific area, suggests that this investigation forged a most needed beginning into this area of inquiry.

Related Research

The review of literature was divided into four major sections, in addition to the summary. The first part focused upon establishing a rationale for exploration of specific environmental variables conceived to be positively related to development of art-related problem solving skills. The second component directed attention to previous studies concerned with individual performance in situations of a private or group character. The third segment examined literature on how varied cognitive processes are modified as the result of noise interposing on those operations. The final section explored implications' applicability suggested from the review. Each variable identified for consideration within the framework of this investigation was effectively documented as to the underlying rationale supporting examination of that variable. A most pellucide and parsimonious theoretical foundation which drew upon various psychological, physiological and sociological studies was developed capably.

Methodology

The third chapter presented the design of the study, population information, treatment procedures, measures obtained, analysis of the data, and summary. Design matrix of the study was a 2x2x2 factorial representation with block-interaction confounding. This research strategy allows for intentional confounding of second-order interactions in order to permit increased economy in groups, and as presented in this investigation should be considered as an elaboration of the Campbell and Stanley (1963) post test-only control group design.

The population sample of this investigation consisted of 186 subjects drawn from eight third- and fourth-grade classrooms from two schools. The subjects were considered to be randomized as a result of registration procedures which established the intact groups subsequentially selected for study. This specific procedure for attaining a random sample established by Kendrick (1960), and later utilized by Cromer (1971), and Zimmerman (1970) serves as a valuable procedure for utilization of established intact groups. However, researchers contemplating use of this procedure should gain assurance that such a computer process of selection is in fact randomly based prior to using this methodology for identification of subjects. Because such assurances could not be determined from the context of this study,

their apparent absence requires a degree of tempered restraint regarding the findings and subsequent conclusions drawn from this investigation.

Treatments consisted of a privacy condition of four enclosed booths equipped with conventional classroom equipment and the noise attenuation situation wherein subjects were provided with sound attenuated headsets. Various alternate treatment combinations were established between the privacy condition (Factor A) and the noise attenuation condition (Factor B) and grade level (Factor C). Treatment combinations were randomly assigned to the eight classrooms. Five separate measures of performance were used: (a) convergent visual problem solving ability, (b) divergent visual problem solving ability, (c) existing and preferred home privacy, (d) usage of privacy and noise attenuation equipment, and (e) IQ. In each instance, Moffit presented a notable review of the supporting qualifications associated with each instrument selected to obtain performance measures.

Experimental procedures during the investigation included a description of equipment placement, instructions to teachers, instructions to children, treatment period, and administration and scoring of the home privacy questionnaire as well as the criterion instruments. The researcher projected for each of the preceding considerations a competent and clear statement detailing the exact procedure employed, justification and supporting data for such procedures, and personal attempts to diminish or eliminate possible researcher bias. The documentation attention given to this section of the research endeavor is extremely important, in that it is critical to any future attempts by researchers considering replication of this study. The extent to which Moffit endeavored to precisely delineate and photographi-

cally illustrate pertinent factors necessary for follow on investigations is noteworthy. As a result, replication of this study seems feasible.

Results and Discussion

A total of 44 tables and 19 figures were developed to illustrate findings. In order to facilitate reader comprehension, a series of tabular forms summarizing significant differences were presented, in addition to those normally required. This reviewer found this feature exceptionally helpful in attempting to analyze the assembled data. As a consequence, it is this reviewer's recommendation that future researchers be encouraged to consider a similar course of action when confronted with developing a satisfactory presentation format for statistical data of an extremely complicated nature.

The analyses of data resulted in the appropriate rejection of primary hypotheses 1, 2, 3, 4, and 6, secondary hypothesis 1 and incidental hypotheses 1 through 6. All other hypotheses were not rejected. The researcher gave considerable attention to providing explanation, qualification, and interpretations required in light of the conflicting data obtained at a significant level. The results demonstrated a complex, interacting pattern of effects and the relationships with respect to the variables considered. The effort exhibited by the researcher to communicate not only the interpretation she ascribed to the data but equally, and perhaps more importantly, the supportive rationale for doing so measurably enhanced the quality of this investigation. Recapitulation of the findings is not required here since these are listed in the researcher's abstract.

Chapter Five summarized and submitted recommendations for future research. Moffit noted that the study did not demonstrate a simple pattern of relationships and effects with re-

spect to the environmental variables considered. In light of this finding she recommended 11 possible directions for future investigation. The major suggestions:

1. Further determination of the considered environmental variables as they affect visual flexibility and originality.

2. Studies toward gaining additional insight into which personality characteristics, abilities and home conditions significantly coincide with an individual's need for privacy and noise attenuation opportunities.

3. Investigation of teacher attitudes toward privacy and noise attenuation conditions in the classroom.

4. Exploration of personal space theories and the need for privacy.

Reviewer's Commentary

The research problem selected by Moffit was one of considerable merit and worthy of substantial investigation. That she chose to study the variables of interest within the classroom context of public schools, rather than selecting subjects from college level elementary service courses added to the significance of this effort. Preparation of the investigation in agreement with accepted research guidelines, coupled with the use of proven models of research presentation, demonstrated that a most readable and competent thesis is capable of construction without derivation into unproven models that a majority of beginning researchers may find difficult to manage. The results of this study indicate that it is a fertile ground for additional investigation. It

is hoped that researchers in the field will be encouraged to give greater attention to this area of concern.

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THE EFFECTS OF TWO PERCEPTUAL SETS UPON THE SUBSEQUENT PERCEPTION OF PICTURES: AN APPLICATION OF THE PERCEPTUAL THEORIES OF JAMES AND ELEANOR GIBSON AND JEROME BRUNER

Jon Wesley Sharer, Ph.D.
The Ohio State University, 1975

Abstract

Two different methods of presenting and responding to pictures are investigated: one is based on Jerome Bruner's perceptual theory. The Bruner method assumes that a stimulus is unstructured until it is classified. It is a cognitive approach in which a viewer's perception is altered through changing the category, especially the linguistic category, which is used to hypothesize about the identity of a stimulus. In contrast, the Gibson method assumes that a stimulus is structured and emphasizes the differentiation of new variables of stimulation. It is a stimulus-oriented approach in which a viewer's perception is altered through changes in his visual frame of reference and the stimulus context. One does not try to alter the viewer's disposition or conception of something directly, e.g., through reinforcement of response, but provides the viewer with perceptual experiences through which he can detect new stimulus relationships and accordingly alter his conception of something or his response to it.

Based on a review of the literature which indicated the conditions under which the Gibson and Bruner oriented methods and explanations of these methods seemed useful, it was hypothesized that a Gibson oriented method would be superior to a Bruner oriented method in identifying artists' painting styles which requires the detection of stimulus specific features of paintings, and that direct comparisons between a visual and verbal target stimulus or standard and stimuli being compared with this standard, i.e., the simultaneous presentation of stimuli, would lead to significantly more correct identifications of artists' styles than would indirect or a successive presentation of stimuli.

To test these hypotheses 96 seventh and eighth grade students were selected from intact art classes. In groups of six, students were shown either two examples of the target style or a verbal description of a target style, and they were asked to identify subsequent pictures whose style was different and/or similar to the two target examples or the verbal description. A learning display was then presented either simultaneously or successively which consisted of four target styles and four distractors, and finally two criterion displays were presented which consisted of eight target styles and eight distractors each.

The data was analyzed using a three between one within partial hierarchical analysis of variance design, and post hoc comparisons using Dunn's test were made for variables having a significant F ratio. The results indicated that there was significant disordinal interaction between the temporal order of the learning display and the criterion display, but post hoc comparisons revealed conflicting results. However, the Gibson approach was significantly superior to the Bruner approach and the former approach resulted in not only more correct identifications of style but more responses to variables of stimulation than the Bruner approach.

Based on the results of the Gibson and Bruner methods, it was concluded

that 1) one's task set structures the kind of information attended to and responded to so that pictorial comparisons focusing on differences are not the same as those focusing on similarities in facilitating the identification of novel and complex pictures, 2) even though the same stimulus is perceived, the same information is not necessarily detected and that linguistic clues should not be assumed to be the same as visual clues in assisting learning to attend to the characteristics of pictures, and 3) pictorial learning is facilitated for complex pictures when the standard for comparison is external rather than internal.

Review

Harold McWhinnie
University of Maryland

Statement of the Problem

The major problem this reviewer had with this study was the initial statement of the problem. The greatest weakness of the study was the lack of any convincing argument as to why the study was relevant to art education and worth doing at all. Indeed, the study is very relevant but the author did not build a sufficient argument in his introduction to convince most researchers, let alone art educators in general.

The study seems to be about alternative modes of presenting visual materials. It further seems to be concerned with how effectively art teachers arrange visual materials for their students. The author claims that art education literature lacks significant understanding as well as hard data of how the use of pictures affect aesthetic learnings.

Traditionally the art history class uses the comparative method and employs at least two slide projectors. More recent experiments in multi-media

presentations employ as many slide projectors as can be asembled in one room. These all seem to fall into the category of simultaneous presentations of visual stimuli. On the other hand, aestheticians have preferred successive presentations of art works, often arguing that the successive method allows for contemplation and the deep development of aesthetic attitudes and understandings. Therefore, it seems to this reviewer that order of presentation is the basic variable under study. It is too bad that the author did not spend more than one page on the background and rationale for the study.

Although I am not at all sure that this is a significant problem for the field of art education, the author of the study does not really help me decide whether it is significant and relevant.

The author tells us that this study will focus upon perceptual learning resulting from the way pictures are used and the effects of this learning upon pictures subsequently perceived. In one page the author dismisses his rationale and then proceeds to the real reason for doing the study, a comparison between the theoretical positions of Gibson and Bruner towards the development of perceptual sets.

The study is really about simultaneous vs. successive stimulus presentation and verbal perceptual set (Bruner) versus visual perceptual set (Gibson). This is a good topic for study, at least in the psychology of art, but what about for art education?

The following hypotheses were developed for this study: (a) That an external *visual frame of reference* emphasizing differentiation will be more effective in helping identify a class of artists' styles than will an internal frame of reference in which pictures are structural through *a verbal description of features* critical to the target class, and (b) that the *simultaneous method of presentation* will help identification more than *the successive method of presen-*

tation, and that the effect will be more pronounced when a greater number of pictures are presented.

Related Research

The related research section lacks any theoretical rationale or overall conceptual structure which would enable the reader to integrate the many disparate studies that have been reviewed.

The section begins with a general survey of theories of perception and then narrows the reader's attention to the work of Bruner and Gibson. Reviews of their work were well organized about the specific topic of perceptual set.

The review of research also demonstrated clearly that art educators have done little work in this general area. Studies by Gilbert Clark (1:1972) and Howard Gardner (3:1970) are among the more important and the most recent. The unfortunate lack of research in art education forced the author to review studies in the psychology of set induction and many studies in perceptual identification.

Herein lies another major fault. The study drifts more and more into realms of general perceptual psychology and has less and less relevance for art and art education. This same weakness was characteristic of earlier studies in perceptual learning and art by Efland (2:1965), McWhinnie (4:1965), and Salone (5:1965).

While the literature in visual and verbal set induction is of interest, its essential relevance for art education could have been strengthened and points of correspondence noted in the text. Again, the studies about the superiority of visual or verbal recall is important and the data cited is impressive about the volume of visual memory available for the human mind. For example, the studies cited on name learning indicate that some organizing label such as "artistic style" is useful for memory and categorization tasks which involve many items.

But is aesthetic education only identification and categorization? One might be able to pass the usual general art history survey course but is that behavior necessarily aesthetic? The studies during World War II of airplane identification indicated that many people could learn to recognize and categorize complex shapes, but is the application of airplane identification techniques to art history learning desirable? (This study, by the way, demonstrated the instructional techniques used in the majority of art history survey lecture courses are based on sound psychological principles.)

Many years ago David Ecker demonstrated that just because one kind of learning was possible did not make it desirable. One could teach children to pick pockets expertly as did Fagin of Charles Dickens fame, but does that make picking pockets desirable? In psychological studies one needs to be very careful of creating an "ought" out of an "is."

Some omissions occur in the review of literature, namely a study by Hysell (6:1972) on the use of advance organizers in art learning. Because Hysell's work directly relates to this study and involves art and art learning variables, its omission is a puzzle to this reviewer.

While the overall review of related research is well done, technically this reviewer is not sure how critical and selective the author has been.

As doctoral students often do in their dissertations, the author may have attempted too much. He seems to have been more interested in the work of Bruner and Gibson. He may have improved the study by concentrating the entire dissertation on the works of those two psychologists and dropping altogether the experimental aspects. Or the author could have done less with Bruner and Gibson and concentrated more clearly on a study of set induction in art learning.

Research Methods

On the whole, the research methodology section was very clear, well-designed, and well done, although this reviewer questions the selection of test items which were the work of Picasso, Chagall, Van Gogh, and Utrillo. The only rationale given is that such artists' work were common in schools. Is that rationale sufficient? Was enough care taken in the selection of test items since that is what this study is all about? What if, for example, one sought to teach discriminations between Picasso and Brague, Van Gogh and Gauguin, Chagall and Max Ernst, and Utrillo and Monet. Would the results have been as clear-cut?

A clear justification for the test-items and distractors was not fully developed or clearly stated. The methods used for developing the test instrument, testing for the validity of the instrument, and testing the procedures for use in the later study seemed to be very complete and well carried out, however. Population selection and sampling procedures were both consistent with the aims of the study and with the problems of working with intact classroom groups.

Design and field work, were well done, procedures were clearly developed, and some care was taken to guard against the many sources of invalidity in psychological studies of this type. The two orientations tested were clearly distinguished both in content and design.

Statistical methods were well chosen, the data analyzed carefully and presented clearly and well. Much of the secondary data is placed in appendices so that the reader is not over-burdened with too many tables in the body of the study. Only the relevant data were presented in the body of the paper. This reviewer has no argument with the manner in which the study was designed and carried out.

Results and Discussion

The initial problems with the rationale for this study become evident again when the author attempts to discuss the data and draw implications for art education. If the study had been a purely psychological study within the psychology of perception and learning, no such weakness would be evident. The author would draw his implications for future psychological research and the study would be concluded and judged well done. As a psychological study, it was indeed well done. Is it too much to ask of a doctoral study to make relevant applications for art education also? So many studies are well done but fall down on implications to teaching. This is a burden that most psychological studies do not have to bear.

As was hypothesized, this study found that the Gibson orientation is superior to the Bruner for identification and differentiation since differences as well as similarities were utilized in the Gibson instructional strategies, whereas Bruner emphasizes only similarities.

What this study demonstrated was that either the Bruner or Gibson means of classification worked depending on which outcomes were desired. Unfortunately, the study gives no basis for selection among desired outcomes and the reader is left to his or her own decision-making. The implications for research and for leading could have been expanded. More examples could have been given as to how to present art to children according to either the Bruner or the Gibson methods as well as why and when the teacher would wish to use one or both approaches.

As with many psychological studies of art learning variables, this study demonstrated that this is not an "either-or" situation. One method is not superior to another but both methods work, have desirable outcomes, and can be employed to different instructional goals.

And as with most psychological studies, this study's data does not really help with the questions of goals and objectives. Although throughout this study the author seems to favor the Gibson approach, a follower of Bruner can also derive value and data to argue for the alternative points of view. The study concludes:

> "Thus, in making comparisons which involve the classification of pictures, teachers should not assume that the methods of making such comparisons result in similar information being attended to. As the study demonstrates, pictorial comparisons based on differentiation and an external frame of reference are different from those based on equivalence and an internal frame of reference. Each presumes a different relationship between classification, perception, and stimulation."

Reviewer's Commentary

I am not going to criticize the institution which awarded the degree or the student's doctoral committee, as some reviewers have done in recent issues of this journal. I have found this dissertation acceptable as a piece of doctoral work and in spite of the many comments and suggestions in this paper for improvement of the study, I probably would have approved it in the present version. I say this being well familiar with the institution which awarded the degree. I served on several doctoral committees at that school and am very familiar with the procedures and quality-controls. The candidate, institution, and doctoral committee did a good job.

Too often we view doctoral dissertations in the category of "Great Works."

They are not. They are exercises and I am far more interested in what is learned from doing the dissertation and what the scholar will do in the future than in the final product. The comments made in this paper are relative to the future and not the past. Hopefully the dissertation study itself is only a prologue.

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AN EXPERIMENTAL STUDY OF SINGLE AND DOUBLE PROCESS CERAMICS: VISUAL AND HAPTIC APTITUDES

Donald Victor Bendel, Ed.D.
Arizona State University, 1975

Abstract

This study investigated and compared the advantages and disadvantages of single and double process ceramic art in an educational situation, and explored the effects of energy conservation, in both fuel and time, with the overall aesthetic quality of work produced by the students.

A 3 x 3 x 3 analysis of variance further described as a Split-Plot Design with repeated measures on one factor was used to analyze the data. Where appropriate a Newman-Keuls Sequential Range Test was used to show where the differences between the means exist.

The population of the study consisted of 58 college students who, in the Fall of 1974, were enrolled in their first college ceramic art course at Northern Arizona University.

Each group received one treatment each week for three weeks. The treatments utilized the first 45 minutes of the class period and the entire following class period for individual work on projects.

Three means of data collection were used: (a) an information form; (b) Viktor Lowenfeld's Tests of Visual vs. Haptic Word Association; and (c) a gestalt judgment by three judges on the Overall Aesthetic Quality of student ceramic art work.

Results based on the statistical findings included the following: (a) students working in the double process method and the control group scored significantly higher in overall aesthetic quality of their work; (b) the single process group used only one-half the amount of time and energy as the double process group and approximately three-fifths the amount of time and energy as the control group; and (c) there is no preference or trend indicated by either the visual or haptic-type student as to the single or double process method of producing ceramic art work.

Review

Jerry G. Smoke
Central Michigan University

This study appears to have grown out of certain practical concerns in ceramics as well as theoretical concerns in art education. The researcher's statement of the problem begins with three purposes of the study:

1. To explore learning through the creative activity of single process ceramic art,

2. To compare the advantages and disadvantages of single process ceramics with double process ceramics in an educational situation,

3. To investigate a possible relationship between student work completed by double and single process ceramics and visual and haptic aptitudes.

Certainly these statements are forthright and unencumbered by much of the pervasive jargon one often finds in research studies. One paragraph later Bendel states the null hypotheses in corresponding order to the above purposes:

1. There are no significant differences between the respective aesthetic qualities of student ceramic art work produced by single and double process methods.

2. There are no significant differences between the relative aesthetic qualities of student ceramic art work produced by the single or double process method and the respective energy expended.

3. There are no aesthetic differences related to either visual or haptic aptitudes between the single and double process methods of producing ceramic art work.

It was interesting to note that the first general statement of purposes was to "explore learning through creative activity," while the corresponding null hypothesis refers to "aesthetic qualities of student ceramic art work," with no explanations for such a conceptual leap. While the reader is puzzling out this problem, a look at the second null hypothesis reveals the first one all over again but with an expenditure of energy clause attached. The plea for energy conservation in single process ceramics as opposed to double process is a valid one and perhaps appropriate to a dissertation dealing with allocation of funding in educational administration, but is given too much weight in this dissertation. The third hypothesis about aesthetic quality and visual and haptic aptitudes in single and double process ceramics follows from the original two hypotheses; however, no rationale is given at this point for why Lowenfeld's categories of aptitude are important to the study. For example, Beittel and Burkhart's spontaneous, divergent and academic ways of learning would have been just as relevant as concepts to deal with in a study of ceramic methodologies: in short, some rationale for visual-haptic at this point would have helped.

Related Research

The review of literature begins with a heading called "Education for Aesthetics," which begins with a plea for synaesthetic efforts by students in ceramics in order to reach a high plane of aesthetic development. Discussion of Tsugawa, Appleby, Read and Arnstine in this section provides a wide range of theoretical stances from which to place an empirical study. Most of the review is concerned with supportive statements for total sensory involvement with the materials of art.

Table 1 is inserted at this point. It is a chronological listing of rationales for art education from 1749 to the present. The reason given for a table six pages long was aesthetics and art education rationales' major importance to the study. This reviewer suspects that someone on Bendel's committee wanted to make sure he knew the history of art education because the table does little to complement the purposes of the study. The review continues with selected quotes from such divergent philosophic stances as those of Pepper, Santayana, Bell, and Kant, giving the appearance of a literature search which did not account for the whole philosophic system from which the quotes were taken. This leaves the reader with the problem of reconciling the analytic critiques of Kant with the romanticism of Santayana and not understanding what either has to do with the stated problem.

The next major sections of the review of literature take into account single and double process ceramics and their origins, some general types of pottery such as earthenware, stoneware, methods of glazing, the growth of ceramics during the Industrial Revolution, and the technique of Double Process. The chapter is concluded with a review of the basic literature related to visual and haptic aptitudes. Lowenfeld's basic

definitions are accepted without qualification as well as his caveat toward visual perception alone as a criteria for a total artistic experience. Emphasis on this latter point becomes more evident as Bendel asks the judges to evaluate an overall gestalt quality in the finished student pieces.

Methodology

The selection of the population for this study appears to have been well chosen with random assignment to control and experimental groups. A student information form was used to determine how many of the beginning ceramics students had art classes prior to this experience and their class level, sex, and age were recorded. The all college student population was 72% female, which automatically makes it different from the population outside the university. Hence any generalizations to the whole population might be suspect. Lowenfeld's Test of Visual vs. Haptic Word Association was given during the first class meeting.

Three weekly treatments of groups were conducted with the single process group, double process group, and control group. The students were given an hour lecture and demonstration with slides and then another hour to carry out the process demonstrated that day. These demonstrations were of the three major hand building methods: coil, pinch, and slab pottery. After the pieces were finished they were evaluated for overall aesthetic quality by a panel of three judges previously trained by the researcher to use the Overall Aesthetic Judgment Scale, which incorporates high to low ratings on various qualitative criteria. The criteria defined were: (a) organizational unity, (b) craftsmanship, (c) originality, and (d) difficulty. After the judging, the data were given a 3 x 3 x 3 analysis of variance treatment with repeated measures on one factor. This

design took advantage of "measuring simultaneously interaction relationships of the treatments on the several variables," while differences between mean scores were measured by the Newman-Keuls Sequential Range Test. Intrajudge reliability was tested by a 3 x 3 x 3 analysis of variance. The F ratio for treatment by groups, i.e., single process, double process, and control groups, indicated $P < .05$, showing evidence that the treatment was effective and produced differing results to a significant degree. A Newman-Keuls Sequential Range Test was used to determine the differences between mean scores for the three groups. These scores were found to be significant between the control group and single process group as well as the single process group and double process, but not between the control and double process groups. Hence, null hypothesis one was rejected. Differences in aesthetic quality do seem to appear between groups who do single process ceramic works and those who do double process ceramic works.

Null hypothesis two was treated like the data from null hypothesis one, with the results showing a significant difference of means between control and single process groups as well as single process and double process groups leading to the rejection of the first part of the second null hypothesis. The second part of this hypothesis was not a primary part of the study, but yielded information of relevance to the ceramic instructor. Figures 5 and 6 graphically illustrated the savings in fuel and instructor loading time between the three groups. As one might expect, the single process group required less energy in fuel and time than the control or double process groups.

Null hypothesis three was not rejected because the "t" value and "r" correlations showed no significant

differences in the combined groups of visual vs. haptic and pottery type.

Results and Discussion

The conclusions reached in this study adhere very closely to the results of the data analysis. Most significant differences occurred, logically, in the groups receiving the most extreme treatment. However, Bendel also found in the data those inevitable spillover conclusions that one does not expect when doing a controlled study. One example was his conclusion that because no students in the single process group failed to finish the course, single process was not as demanding as double process, where only 18 of 21 finished, or the control group, where 16 of 20 finished. However, he points out that the data also indicate higher aesthetic quality for double process and control groups because these processes demand more time working with qualitative ceramic concepts. With the quantity of tables and figures showing his research process it is not hard for the reader to go back and find support for such conclusions. In short, the conclusions stay well within the parameters of the study.

Implications for theory and practice are listed and appear to be aimed at the practical side of education rather than at theory. I had hoped that there would be some suggestions for improving critical methodology in ceramics or at least a model for developing ceramics programs based on the findings, but beyond the experiment such was not the case. If the double process methodologies enhanced the aesthetic quality of finished work because of additional time spent by the students in the studio, then what was the nature of the working process during this extra time? Is it possible that extra time spent by students working with single process ceramic pieces might also improve

their aesthetic quality? There was no follow-up on this question.

The recommendations for further study do suggest that sustaining motivational drive for single process ceramics might be profitable as a study. Another suggestion was one that continues to plague art educators who are concerned with qualitative judgments in their studies; that is, how to train judges and how to get inter-judge agreement on specific criteria. Most of the recommendations for further study would be reasonable avenues of inquiry for one interested in ceramic art education. Duplication of this particular study might reveal stronger variances between single and double process groups as well as the control group. However, I doubt if it would shed any more light on the visual vs. haptic aptitude of students due to the way the analysis of variance was set up. To begin matching haptic verbal characteristics, for example, with specific forms in a ceramic piece would require a different kind of testing situation and statistical treatment that would not duplicate this study but rather open up a different domain of questioning.

Reviewer's Commentary

Although the major tenets of this thesis were clear and presented in logical order, I have serious reservations about Bendel's topic. It seems to this reviewer that what students learn about ceramics is of more importance than the quality of the work they produce. While it may be true that qualitative factors give an indication of what the student can do in a post-facto way, the rating by external judges says nothing about what the student has gained from the class in either the cognitive or affective domains. The failure of the significance levels to reject null hypothesis three lends support to this idea. I also ques-

tion the importance of the visual-haptic verbal testing because the particular word associations chosen by students who were haptic, for example, might not match the criteria used by the student to produce a ceramic work. In short, the student may have been haptic in a verbal sense but non-haptic in the kinesthetic sense.

This reviewer feels that there was an uncontrolled variable in operation within the control group, namely that this group had a choice of working with single, double, or both processes. Knowledge that one is free to make choices and knowledge of available alternatives would certainly have an effect on one's feeling about the atmosphere of the classroom and one's willingness to participate in activities.

There is always concern on this reviewer's part when a study is done via empirical means and the researcher also teaches the control and experimental groups. This leaves the entire study open to questions of bias, especially when the researcher also trains the judges in how to evaluate the final products.

In summary, I am left with an image of yet another doctoral student in art education struggling to grasp the procedure of the scientific method and use it on a problem that was refined and reduced until it had no life left in it, leaving the reader wondering what happened to the excitement of making that first slab pot. Methodological difficulties and philosophical uncertainty about the scientific method are not meant to be the handmaidens of research. One still questions the validity of an educational system that accepts carte-blanche the methodology of science to explain the qualitative character of art.

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THE DEVELOPMENT, APPLICATION, AND IMPLICATIONS OF A CURRICULUM DEVELOPMENT MODEL

Maria Paula Winkler-Green
Penn State University, 1974

Abstract

This thesis is directed toward college teachers in the two-dimensional fine arts who teach both art and non-art majors; thus serving students of varying abilities and interests. The major focus of this paper is the integration of the following specific teaching and curricular concerns: interpersonal communication skills between teacher and student; open-ended art projects within a progressive, overlapping, and thematic series of assignments; the exercise, understanding and ordering of cognitive skills, exposure to new perceptions and ideas; developing a student's facility in self-evaluation and self-awareness; and developing autonomy in the student in the construction of art projects and setting goals. When organized, integrated and adapted, these components provide a construct for an open-ended and relevant art curriculum for the student. The purpose of this curriculum structure is to devise a method for developing a curriculum in the studio arts that would shift the traditional focus on skill training and end products, toward a development of the student's conceptional, perceptual, intellectual, and technical strategies in the arting process. The basis for this curriculum model is humanistic psychology and the relevant interpersonal communication skills that can best facilitate its implementation.

Review

Ivan E. Johnson
Florida State University

Statement of the Problem

The quest continues for curriculum models for the teaching of art in higher education. Winkler-Green has formulated a curriculum model for such a purpose incorporating theories of humanistic psychology. In a prelude to the statement of the problem she explains that "the purpose of this thesis is to formulate a student-centered curriculum model for the two-dimensional visual arts in higher education." A second purpose is "to propose a set of conditions which need to be considered in order to determine appropriate teaching practices in art education." The utility of this model, it is pointed out, will remain for art educators to test through independent research. To further clarify her thesis she explains why she chose to draw heavily on the theories of three contemporary psychologists: Abraham Maslow, Carl Rogers and J. Paul Torrance. This section of the introduction seems misplaced. It might have served her hypotheses better had it been a part of her exposition in Chapter 2 (The Facilitating Relationship) wherein related researches and theoretical positions are examined. Possibly it was the intent of the researcher to build a line

of argument as an introduction to the statement of the problem, a strategy which should not seem necessary for readers who are research oriented.

In the statement of the problem Winkler-Green writes that "this curriculum model is directed toward college teachers in the two-dimensional fine arts who teach both art and non-art majors. A capsule description of the curriculum model as it functions for this population is as follows: a mixed class population of both art and non-art majors participate in a dialectic between an imposed curriculum structure and a teaching strategy that creates open-ended options within that structure. The implementation of this curriculum structure is facilitated by the interpersonal communication skills between teacher and student, which aid the student moving toward functional autonomy, self-actualization, and authentic "arting." The remainder of the statement of the problem is technically an outline of procedures the investigator followed to develop her study. The application of the model was tested in two different situations using participant-observer methodology. The first was in a 10-week watercolor class; it is illustrated in Chapter IV. The data collected were used to illustrate, for the purpose of the paper, a possible dialectic between an imposed curriculum structure and a teaching strategy that created open-ended options for students within that structure. The other situation, illustrated in Chapter 5, used a drawing curriculum to show the application of the curriculum model on an individual basis, concentrating on creating open-ended options through adapting the imposed curriculum to an individual's interests and goals within a classroom situation. An explanation of the application of the model was believed by the investigator to be pertinent to the statement of the problem.

Related Research

Some investigators set aside a special section of their paper for reviewing related research. Others bring to bear pertinent research as they formulate step-by-step the basis for their investigations. Winkler-Green chose the latter course. She interpreted theoretical sources as they bore on the construction of her model. Theories of Abraham Maslow, Carl Rogers and J. Paul Torrance are offered in support of her hypotheses. The work of such writers as Berman, Klee, Eisner, Edmonston, Bradley, Peterman and many others in art, education, and psychology were cited to substantiate aspects of the framework. The implementation of interpersonal communications skills derived from Maslow and Rogers, for example, facilitates her conception of teaching.

Winkler-Green continued in Chapter 2, as she had in her Introduction (Chapter 1), to draw upon related researches. Central to her thesis is the facilitating relationship (p. 12). The facilitating relationship is the establishment of "an appropriate psychological climate for learning in the classroom as well as channels for communication between teacher and student." Writings of J. Paul Torrance were quoted to underline the importance of good communication to the creation of an accurate and responsive environment in order to stimulate creativity in the student. Writings of Rogers and Stevens were also introduced in this connection. Mentioned here were the findings of the Barret-Lennard Relationship Inventory, a study of students' attitude toward their teachers. She leans heavily on Louise Berman's theories (*New Priorities in the Curriculum*, 1968) for curriculum construction. The assumption emphasized here was that all persons are process oriented

to some degree and can become more so through involvement in planned experiences. Another aspect of the facilitating relationship, according to Winkler-Green, was the extent to which the curriculum model nurtures self-actualization or arting. Concepts of Maslow, Rogers, Skinner, and Torrance are woven into Winkler-Green's examination of the nature of the learner's interpersonal relationships. She was selective in choosing sympathetic and pertinent researches. Little counter source material is mentioned.

Research Objectives

The researcher introduced early her objectives within the Statement of Objectives, e.g., to construct a curriculum model directed toward college teachers who teach both art and non-art majors. She sought to devise a model that enabled a mixed class population of both art and non-art majors to participate in a dialectic between an imposed curriculum structure and a teaching strategy which created open-ended options within that structure. Further, the implementation of this structure, when operational, would be facilitated by interpersonal communication skills between teacher and students aiding the student in moving toward functional autonomy, self-actualization, and authentic arting. The statement of objectives seemed to make clear the intent to formulate an alternative curriculum model. It could have been less repetitive and complex.

Methodology

The use of theory in the dissertation, according to the researcher, followed the participant-observer model; the curriculum model was defined by a body of theorems, postulates, and concepts to present a systematic view of this means of art education. The development of the model was applied and implemented in two different classroom situations. One classroom situation was one in which a teaching strategy that created open-ended options could be integrated with an imposed curriculum so that students would have maximum opportunities for individual development and creative problem solving. This was done in a 10 week watercolor class.

The other classroom situation involved a drawing curriculum to illustrate the application of the curriculum model to the unique needs and goals of an *individual student* within the classroom situation. Both classes utilized the same general curricular structure in terms of thematic, open-ended art assignments and various forms of communication techniques and resources. The key difference in the two situations (aside from the means of data gathering) was that the watercolor class focused on the model as it affected the class as a group while the drawing class focused on the personal interaction between one student and teacher within a larger framework.

With the watercolor class participants the following components were implemented: the thematic, serially progressive (from simple to complex), and open-ended art assignments; problem solving, involving technical and perceptual skills; self-evaluative tools and skills, such as critiques, notebooks, journals, alternative assignments; time structured projects and an increased proportion of attention to functional autonomy. Four thematic categories were incorporated in the watercolor curriculum: changing perspectives and perceptions; creating deviations from reality; painting senses and feelings; and painting concepts and ideas. Each student was instructed to keep a creativity notebook, technique notebook, problematic notebook, a project evaluation for each assign-

ment and an alternative assignment. In Chapter 4 Winkler-Green details how the results of the five assignments were used to gather data on the responses of the class's 20 students. The data were randomly selected in order to decrease bias. She reported discussions ensuing from interviews and teaching strategies.

In the second classroom situation she selected one student for study to illustrate how a teacher can work on an individual basis with students. Instead of using a battery of assignments as in the watercolor class, the instructor emphasized private communication between teacher and student within the class situation. The data in this situation were gathered from the student-teacher discussions and excerpts from the student's own journal described how she solved various problems. Winkler-Green intended that the research data be used primarily to illustrate the functioning of the model and not to empirically corroborate and substantiate empirically the postulates and assumptions presented.

Winkler-Green concluded, upon analyses of her data and an examination of related researches, that where teachers desire a student-centered curriculum and where they seek student response her model is a potential alternative in art curriculum development. Communication and cooperation between teacher and student were reported positively aided by the use of interpersonal communication skills. These skills provided an index to the effectiveness of the teacher's strategies and revealed whether the student's responses were genuine and relevant. In the Appendix a section on Basic Communication Skills is provided. Described here were optimal teacher strategies to generate critical dialogue. It would be interesting to pursue further the impact of the implementation of these skills on the stu-

dent's attitude toward his teacher. Excerpts from journals and discussions provided glimpses but not a complete picture of changed behavior on the part of the student nor what modification was made from time to time in the teacher's strategies.

Results and Discussion

It is difficult at best for a participant observer to be truly objective. Winkler-Green protests that she was as objective as any researcher could be. She prepared herself to avoid such problems as a culture bias and emotional involvements. It would have been useful for her to have built into her design a place for additional observers. Then the data could be examined at "arms length." Tape recording and even filming (as Beittel did) of actual student production and discussion would have given another dimension to the investigation. It is a temptation to make a theoretical model a mirror image of other's concepts. Albeit the contributions of such humanistic psychologists as Maslow, Rogers, and Torrance are monumental and have extensively pervaded much of the theory of art education in the last 20 years. One wonders if the case for this model could not be strengthened by collecting data on two classroom group situations and on more than one individual student. By increasing the population and the time covered would not the researcher have gotten additional information on change?

Reviewer's Commentary

Art educators should champion the kind of interpersonal relationships, student participation and involvement and freedom of choice which Winkler-Green's model would generate. Like motherhood, we don't knock it. Because it is critical to nurturing creativ-

ity, sensitizing students to aesthetic qualities and helping them toward self-actualization, a continuing quest for alternative curriculum models should be encouraged. More studies of a longitudinal type are needed to build theory. In Winkler-Green's study a possibility is opened up. Some questions remain. Differences in student needs and goals, the nature of the instructional content, and environmental considerations have been reported in recent researches. Further investigation may show how these all relate to Winkler-Green's study.

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THE EFFECTS OF SEARCH PRACTICE AND PERCEPTUAL DRAWING TRAINING UPON REPRESENTATIONAL DRAWING PERFORMANCE AND VISUAL FUNCTIONS

Janet Wai Szeto
Illinois State University

This study investigated the effects of search and perceptual drawing treatments upon the student's representational drawing performance as measured by the Drawing Rating Scale; and upon several aspects of perceptual functions as measured by the Maccoby-Rau Embedded Figures Test, Identical Pictures Test, Hidden Patterns Test, Gestalt Completion Test, and Card Rotations Test.

A 2 x 2 factorial design was utilized. The main effects of drawing, the main effects of search, and the effects of drawing x search Interaction upon six dependent variables were analyzed by two-way analyses of covariance.

The non-search treatment groups scored significantly higher than the search treatment groups on the overall adjusted posttest means for the total scores of the bus drawing ratings and the ice cream drawing ratings. The three criteria on the Drawing Rating Scale were also subjected to analyses.

Data analyses also indicated that the non-perceptual drawing treatment groups had a significant advantage over the perceptual drawing treatment groups on the overall adjusted posttest means of the Hidden Patterns Test. The overall adjusted posttest means of the Identical Pictures Test, Hidden Patterns Test and Gestalt Completion Test were significantly higher on the search treatment groups than on the non-search treatment groups.

Significant effects of drawing x search Interaction were obtained on the Identical Pictures Test only.

Review

Robert W. Ott
Pennsylvania State University

Statement of the Problem

Janet Wai Szeto's dissertation from Illinois State University attends to the issue that ability and improvement in handling visual information can be influenced effectively by deliberate perceptual training. Szeto contends that such visual arts education should not be regarded as a natural by-product of art activities but as substantial contributions to visual and perceptual growth. Szeto is particularly concerned with scanning training upon drawing performance, for her study examines the effects of visual search practice and perceptual drawing training upon the development of an individual's representational drawings. To do this, Szeto relies 'upon the Identical Pictures Test (IPT), the Hidden Patterns Test (HPT), the Maccoby-Rau Embedded Figures Test (EFT), the Gestalt Completion Test (GCT) and the Card Rotations Test (CRT). Szeto states that "Perceptual growth appears to be affected by one's visual information-handling abilities, e.g., the ability to overcome the visual Gestalt, the ability to effectively search for critical embedded patterns of cues in a camouflaged background, recognize and compare the similarities and differences between discriminable configurations and rotations, and organizing (sic) disparate visual information then into meaningful precepts" (p.3).

These abilities, according to Szeto, assist learners to more efficiently organize and synthesize visual information when creating works of art.

Terminology relative to the study is well delineated and before further emersion of the reader such related terms are clearly defined. Included are clearly evolved statements of terms such as articulation, attribute, differentiation, field, field-dependence, field-independence, mode, perceptual learning, perceptual training, perspective, recognition, scanning, search, search targets, visual discrimination, and visual perception.

Related Research

The literature reviewed in the Szeto thesis presents essential information in three categories. The first section deals with psychological studies on various trainable aspects of perceptual performance. From Gibson, Lancaster, Sells and Fixott, Lawrence and Cole, and with reference to Harris and Harber as well as Egeth and Smith, Szeto finds that subsequence recognition responses can be attributed to and influenced by instruction. This suggests to Szeto relationships to a selective training mechanism or the memory process. From these sources, Szeto further postulates that perceptual recognition mechanisms are of value to art educators for uses in their instruction. Such awareness for art instruction, contends Szeto, could be focused to building relevant types of memory which would facilitate subsequent recognition with accuracy.

A further development of the Related Literature in the Szeto thesis reviews the work of art educators who have investigated this relationship between an individual's abilities in organizing visual imput and perceptual training through art instruction. Szeto finds that the psychological theories of perception of Attneave (1954) Salome

(1965) and Reeves (1971) provide an adequate base to deal with the field-dependent-independent dimensions of differentiation. Still other literature of concern in this area is evolved from Kensler (1965) and Rennels (1969). Through the Witkin Study of 1962, Szeto finds support for the premise that "in representational drawing, it is necessary for the artist to be able to extract critical visual informational cues from the figure, while overcoming the distracting background" (p.15).

In the final section of Szeto's literature review, attention is directed toward a premise which influences the researcher considerably towards concepts in perceptual training in art education. Through a study of the work of A. Neisser (1964), in which visual search techniques are used to investigate information processing, Szeto hypothesizes that search tasks assist in enhancing abilities for searching for targets embedded within complex backgrounds as well as abilities to overcome the visual Gestalt and to discriminate objects by a minimal set of critical features. All previous literature sources support Szeto's contention that Neisser's search tasks have merit for a direction for perceptual training in art, for improving representational drawing performance, and for the development of pattern recognition ability. Szeto speculates from the review of such literature that search technique will accomplish these ends in conjunction with "proper" (reviewer's quotes) art activities (p.25). The phrase proper art activities serves to alert the reader of that which is forthcoming in the study as Szeto sets out to define that which can be taught in art as founded upon this statistically-oriented experimental study.

The Design of the Study

The population for the Szeto study consisted of four college classes in

elementary schools art education. Data, measuring the effects of search treatment, drawing treatment, and the interaction of these upon a student's representational drawing as well as upon various aspects of a student's perceptual abilities was obtained from 15 female undergraduates from each of these four classes. Pre- and post-test scores were obtained from a modification of the Salome Drawing Rating Scale, the Maccoby-Rau Embedded Figures Test, and from selected tests in the Kit of Reference Tests for Cognitive Factors published by French, Ekstrom and Price in 1963. Included in these materials are the Identical Pictures Test, the Hidden Patterns Test, the Gestalt Completion Test, and the Card Rotations Test. The Salome Test was used in the study specifically for its quality to elicit and to determine the amount of visual information included in any one student's drawing. The Maccoby-Rau Test determined abilities to discriminate figure from ground by the subjects of the study while the Identical Pictures Test served as an index for the measurement of the rate of time the subject took to form discriminations and to classify configurations into categories. The Hidden Patterns Test, also administered under time conditions, required the subjects to search the image and to sort out irrelevant distracting materials in order to identify given configurations. The Gestalt Completion Test measured the speed of closure and assisted in determining if the subject increased efficiency in identifying objects with a minimum amount of given visual information. Finally, the Card Rotations Test used in this study measured the subject's abilities to maintain orientation to objects within a spatial field. In each test the four treatment groups composing the population of the Szeto study were held constant over a period of six weeks within 10 experimental sessions operating twice a week for 50-minute episodes. The first entry of these sessions was devoted to the pre-test conditions while the final session served to fulfill the posttest session. Both the pre- and posttest sessions were rated by two independent judges. The data from the drawing ratings and the psychological measures were analyzed by two-way analysis of covariance at the .05 level of significance. Analysis of covariance was used for data analyses and to adjust for initial differences accounting for the treatment groups in being homogenous. Szeto also treated the total scores of the drawing exercises within the tests of the given objects of a lamp, a bus, and an ice cream cone individually by two-way analyses of covariance. Additionally, the scores on the closure, proportion, and differentiation criteria of each of these drawings were also subjected to two-way analyses of covariance which served the researcher in providing more information about the specific criteria contributing to most of the variances on the total scores. Most Null Hypotheses were retained as a result of these data analyses with the exception of Null Hypotheses II (a$_{ii}$), which was rejected as not applicable to the proportion criteria of the bus drawing ratings. Szeto includes accurate tables within the study to attest to the submission of these examinations for the reference of the reader.

The tests of the Null Hypotheses of the Maccoby-Rau Embedded Figures Test were likewise all retained by Szeto while the Identical Pictures Test analysis of the Null Hypotheses reflected that the search treatment groups indicated a higher overall adjusted post-test mean than the non-search treatment groups (p.58). The Hidden Patterns Test Null Hypotheses statements were mainly rejected and the Gestalt Completion Test yielded acceptance of two of the three hypoth-

eses submitted. The Card Rotations Test hypotheses were all retained after testing. In totality, Szeto found no significant F-ratios were obtained for the drawing and search interaction on the adjusted posttest means of either the drawing ratings or the pencil-and-paper tests, except in the Identical Pictures Test.

Conclusions and Commentary

The Szeto study of the effects of training upon drawing and the perceptional functions of students indicates that perceptual training taught in conjunction with drawing results in better interpretation and analysis of objects due to delay of closure. The study lays a foundation for interesting future speculations into the areas of art appreciation and design education in art education as related to perceptual training that would make use of contour information for drawing development. Scanning practice and the consequential effects of these upon drawing training are illuminated in the study through the study of these factors by means of a selected and sizeable body of texts and examinations. For those who believe that a means of deliberate teaching can exist in the perceptual training of students, Szeto's study presents evidence that would serve to improve perceptual abilities particularly in the realm of pattern recognition. The 2 x 2 factorial design adopted for the study with drawing training and scanning training as independent variables serves the researcher in the administration of these treatments to the selected populations. Of the four test groups — The Scan and Perceptual Training Group, The Non-Scanning and Perceptual Training Group, The Scanning and Non-Perceptual Training Group, and The Non-Search, Non-Perceptual Training Group — a higher overall adjusted means existed in the perceptual train-ing-drawing groups over the non-perceptual training groups.

The reader, however, might question the forms of the proper art activities and the designated conventional drawing lessons that are built into the tests and exercises administered to all four of the treatment groups. These images and experiences have contributed to the actual visual training that was tested and delineated by the study. They also serve to raise the perpetual questions of not only how art education is to best go about instruction but also upon the question and issues involved in what it is that is worthy of being designated as proper or even conventional. The researcher somewhat eludes to these concerns when advising that future replications of this study select test objects with characteristics which may be more indicative of training effects (p.76). The study does speculate, however, on the character of independence that existed within certain drawing treatments and search treatments and that neither might well be ineffective training strategies for representational drawing performance (p.77). It is, however, the interaction of the drawing and search treatments on the Identical Pictures Test that presents the reader with insight.

The issue of the development of the critical observation powers of the subjects in the treatments presents another set of postulates in the study as the speed of performance is viewed as not always being a positive contributing factor to better interpretation and analysis of objects to be represented. The search training delineated within the study facilitated greater efficiency in absorbing the general properties of objects within the treatments as it served to improve the attentiveness of the subjects during the process. Such teaching strategy explores the ability of individuals to handle visual information offering

insights for the progress of the uses of visual perception in the art education of the individual. Perceptual abilities are shown to be improved when used in conjunction with drawing exercises serving to increase the abilities of students in speed and in the flexibility of conclusions and closures. No outcomes are imposed upon various other aspects of artistic performance in this study. The study serves to identify a specific aspect of perceptual learning that is a necessary goal of art education. Identification of this nature is a considerable contribution to the body of knowledge comprising art education.

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